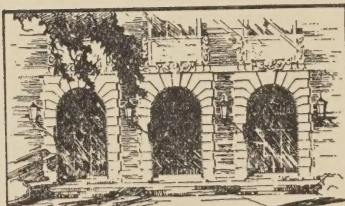


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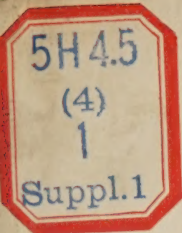
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A MONOGRAPHIC
REVISION AND SYNOPSIS
OF THE
TRICHOPTERA
OF THE
EUROPEAN FAUNA.

First Additional Supplement.

BY

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PREFACE.

Four years ago (May, 1880), when concluding the preface to the original work (with its two Supplements and Appendix), these words were written:—"I hope to continue the Supplement from time to time."

A "First Additional Supplement" is now (June, 1884) brought before the notice of students of these insects.

I am enabled to add nearly fifty species to those described in the original work and its Supplements; some new forms are noticed to which it has been considered prudent to (at least provisionally) assign the rank of varieties; and there is much additional local information. This latter part of the subject might have been extended indefinitely; therefore, a selection had to be made, and the local information here given refers (as a rule) only to countries or districts in which the particular species mentioned had not previously been noticed.

All the species in the original work have passed under review, and, in one or two instances, entire genera have been revised.

Very few new *genera* are indicated. I think the time has scarcely arrived for a generic re-distribution, or, it would be better to say, a subdivision of some of the larger generic groups as now constituted.

Of the additional species here indicated, all but about six are from within the limits of Europe *proper*, a significant fact, and proving that it would be unsafe even to hazard a conjecture as to the number of those forming part of the "*European Fauna*."

Most of my former correspondents continue to help me, and the valuable assistance of others has been secured. To all I tender my hearty thanks, and think I have acknowledged the aid thus accorded in all cases in the course of this Supplement.

But again, and more than ever, are my thanks specially due to my friend the Rev. A. E. Eaton, for it is owing to his various travels in Portugal, Italy, Madeira, the Canary Islands, &c., that *more than three-fifths* of the new species herein described became known to me. If a foreigner making short holiday tours through certain districts previously unexplored (so far as these insects are concerned) can produce such results, it is needless to call attention to what *might* be done by residents in the districts.

The general plan adopted in the original work, both as regards text and plates, has been adhered to; it appears to have answered the purpose intended, even if there exist, in some cases, doubts as to the morphological correctness of the terms used. I have been fortunate in being able to again secure the services of Mr. Jarman, who engraved the plates in the original work, and who has done justice to my own poor artistic powers, so far as the style of engraving adopted would permit.

Once more—I hope to continue the Supplement from time to time. But as the necessities for prompt publication of new discoveries become daily more imperative, it is possible that a “Second Additional Supplement” may consist, more than does this “First,” of collected information previously published in a scattered form.

R. McLACHLAN.

Lewisham, London :

2nd June, 1884.

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FIRST ADDITIONAL SUPPLEMENT.

Fam. PHRYGANEIDÆ.

Wallengren, in 1880, published a synopsis of the Scandinavian species of this Family under the title, "Om skandinaviens arter af familjen Phryganeidæ" (Entomologisk Tidskrift, i, pp. 64—75), in which he attempted more minute generic sub-division. The scheme is tolerably natural so far as it goes, but it is mainly based on certain minute neural characters very difficult to seize, and, if my ideas be correct, not with due regard to the homologies of neururation.* The characters drawn from occult neural differences at the extreme base of the posterior-wings are of extreme obscurity, and I confess to not having been able to follow the author in his details. The presence or absence of a transverse nervule between the costa and sub-costa is used by him for primary sub-division, as by me (cf. p. 14). A second important division is effected according to the point of origin of the sectors arising from the discoidal cell (my nomenclature), by means of which he separates *Neuronia phalænoides* and *atrata* from all the others (excepting *Agrypnia*). Then follow minor sub-divisions. The result is that we get the following generic sequence:—1. *Holostomis*, Mannerh. (= *N. phalænoides* and *atrata*); 2. *Oligostomis*, Kol. (= *N. Stålîi*, *reticulata*, *melanoptera*, n. sp., and *clathrata*); 3. *Neuronia*, Leach (= *lapponica* and *striata* [*ruficrus*]); 4. *Phryganea*, L. (= *grandis* and *bipunctata* [*striata*]); 5. *Dasy-stegia*, Walleng. (= *variegata* [*varia*] and *obsoleta*); 6. *Trichostegia*, Kol., Hag. (= *minor*); 7. *Agrypnia*, Curt. (= *picta* and *Pagetana*).

These divisions are natural enough so far as they go, and I had already called attention to them in the course of my remarks on the genera in the "Revision and Synopsis," but as the Family is only of very limited extent, as compared with some others, it seemed best at that time (and seems so still) to await a new generic revision of the whole before making a partial one based on a local fauna. The latter having been done, I accept it to a certain extent, retaining my original sequence, using Wallengren's subsidiary divisions as "sub-genera" or sections, and basing these divisions upon characters more easy to seize than are those used by Wallengren.

* It should be here remarked that the terminology of neururation used by Wallengren is based upon that of Sundeval, which has met with little acceptance outside Sweden; and it is very misleading to entomologists not acquainted with the peculiar nomenclature: for instance, the "areola discoidalis" is not the "discoidal cell" of other authors, but the area below it (or between it and the superior cubitus), the "discoidal cell" of my work representing the "areola subradialis" of Wallengren. I am indebted to the author for a diagram indicating the terminology used.

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An oblique transverse nervule between the costa and sub-costa (near the end of the latter) in the anterior-wings.

Anterior-wings ordinarily short and broad, with only slight pubescence: apical forks 1, 2, 3, and 5 present in the anterior-wings in ♂ ♀; 1, 2, and 5 in the posterior-wings of the ♂, and 1, 2, 3, and 5 in those wings in the ♀ NEURONIA.

Anterior-wings ordinarily elongate and densely pubescent: apical forks 1, 2, 3, and 5 present in the anterior-wings of the ♂, and 1, 2, 3, 4, and 5 in those of the ♀ (excepting in *P. minor*); 1, 2, and 5 in the posterior-wings of the ♂, and 1, 2, 3, and 5 in the ♀ (excepting in *P. minor*) PHRYGANEÆ.

No transverse nervule between the costa and sub-costa in the anterior-wings AGRYPNIA.*

On this principle the species of *Phryganeidæ* in the European Fauna may be arranged in groups as follows:—

NEURONIA.

NEURONIA, Leach, Wallengr.

ruficrus, Scop., *lapponica*, Hag.

OLIGOSTOMIS, Kol., Wallengr.

reticulata, L., *Stålîi*, McLach., *clathrata*, Kol., *melanoptera*, Wallengr.

HOLOSTOMIS, Mannerh., Wallengr.

phalænoides, L., *atrata*, Gmelin.

PHRYGANEÆ.

PHRYGANEÆ, L., Wallengr.

grandis, L., *Nattereri*, Brauer, *striata*, L.

DASYSTEGIA, Wallengr.

varia, F., *obsoleta* (Hag.), McLach., *Sahlbergi*, McLach.

TRICHOSTEGIA, Kol., Wallengr.

minor, Curt.

AGRYPNIA.

picta, Kol., *islandica*, Hag., *Pagetana*, Curt.

AGRYPNETES.

crassicornis, McLach.

NOTES.

Neuronina (Wallengr.).—Wallengren separates this from its near allies on an obscure structure (uncertain to me) in the neurulation of the extreme base of the posterior-wings. Much more obvious characters exist in the anal parts of the ♂, and in the fact that apical fork No. 3 in the posterior-wings of the ♀ extends to the anastomosis. The two species have very much in common, notwithstanding the great difference in coloration.

* I have not included the extraordinary *Agrypneta crassicornis* (cf. Supplement, p. ii) in this table, its characters being altogether aberrant. I have no further information respecting it, and the entomologists of Finland must decide whether the type is, or is not, an unnatural hybrid; a monstrosity it can scarcely be on account of the symmetry of all its structure.

Oligostomis (Wallengr.).—In Kolenati's signification this included *Neuronia* and *Oligostomis* of Wallengren. The latter founds it on a corresponding, but varying, principle to that which determined his definition of *Neuronia*. The fact that apical fork No. 3 does not extend to the anastomosis in the posterior-wings of the ♀ separates it from *Neuronia* (Wallengr.), as do also the anal appendages of the ♂; but with regard to the latter character there are two distinct groups represented respectively by *reticulata* (with *Stål*i) and *clathrata* (with *melanoptera*), and on anal characters they could not remain in the same division, notwithstanding their extreme outward resemblance.

Holostomis (Wallengr.).—With this Wallengren heads his Synopsis, and bases it on the origin of the apical sectors with respect to the discoidal cell. I fail to see the importance of this character (viewed with regard to general homology), but the two species are so decidedly different from all others, both in markings and in anal structure, that the division is a natural one.

Phryganea (Wallengr.).—The author seeks his characters in the same obscure region of the posterior-wings. According to my views, it heads a series of groups distinct from the preceding series, and individually is very marked in consequence of the anal parts of the ♂, especially the elongate superior appendages. The group is natural so far as applied to European species.

Dasystegia (Wallengr.).—Again we have to deal with obscure characters as defined by Wallengren. In minute subdivision it appears to me that it includes two groups of equal value, one represented by *varia*, the other by *obsoleta* and *Sahlbergi*.

Trichostegia (Wallengr.).—A term used by Kolenati for the entire genus *Phryganea* (as usually restricted by modern authors), and, as I think, injudiciously applied to the most aberrant species, so strongly characterized by the neuration being alike in both sexes, and by the anal parts.

Agrypnia (Wallengr.).—In carrying out his scheme of minute subdivision, the author might have subdivided this into two, according to the neuration, especially of the posterior-wings of the ♀, and also according to the appendages of the ♂. With regard to neuration, the condition seen in the arctic form of *Pagetana* (= var. *hyperborea*, McLach.) should not be lost sight of (cf. Supplement, p. xv).

Agrypnetes (cf. foot-note, ante p. 2).

Neuronia melanoptera.

Oligostomis melanoptera, Wallengren, Entom. Tidskr., i, 68 (1880).

"Wings blackish-fuscous: anterior-wings sparingly reticulated with orange spots, which are more or less confluent, punctiform in the disc: posterior-wings unicolorous. Legs yellow; femora black, yellow at the apex." (Translated from Wallengren.)

Expanse, 26 mm.

Sweden (Trolle Ljungby, 1 ♂).

Not seen by me. According to Wallengren probably only a melanic variety of *N. clathrata*, to which it appears to bear the same relationship that *N. Stålîi* does to *reticulata*.

Phryganea striata, p. 23, and Supplement, pp. i and xiii.—In July, 1882, Baron E. de Selys-Longchamps captured a pair (♂ ♀) at a little lake close to the Simplon Hospice, Switzerland, about 6000 ft., certainly a very unusual altitude for this species; but Meyer-Dür (Mitth. schw. ent. Gesells., vi, p. 303) observes that Dr. Schoch found it on the Melchalp in numbers at an elevation of 6000 feet. These alpine examples are almost without dark markings on the wings, and in this respect resemble a form that predominates in some localities in Finland.

An entirely obverse condition to this form occurs abundantly in the mountains of the Vosges (France); there the wings are nearly black, the pale markings being almost obliterated in the dark ground.

Phryganea varia, p. 24.—Wallengren, in the paper previously alluded to, has acted on my identification of this with *Ph. variegata*, Fourcroy (cf. p. 25), and has restored the latter name. I have already pointed out that there was a "*Ph. variegata*" prior to that of Fourcroy (but belonging to a very different modern genus), and think it inadvisable to unsettle established nomenclature, even if the use of Fourcroy's name be justifiable, which I doubt.

Phryganea obsoleta, p. 26, and Supplement, pp. ii and xiv.—Very abundant in July on the margins of ponds and small lakes in the Vosges (Géradmer, &c., *McLachlan*).

Agrypnia Pagetana, var. **hyperborea**, Supplement, pp. ii and xv.—I think it advisable to bestow a distinctive name upon the dwarf high-northern form described at Supplement, p. ii, and noticed also at p. xv, and at p. lxxxi (foot-note). Although, to my mind, there can be no doubt as to its being a condition of *A. Pagetana*, the examples have so curious an appearance that, at first sight, the idea of their forming a distinct species would be quite pardonable.

I have seen this form from Enontekis, in Finnish Lapland (*J. Sahlberg*), and from North-Western Siberia (Hautauka, Jenissei, *J. Sahlberg*, and Valley of the Ob, *Bergroth*).

Fam. LIMNOPHILIDÆ.

Glyphotælius punctato-lineatus and var. **frigidus**, pp. 41—43, and Supplement, p. v.—Livonia (common at the Peïpus-See from the middle of May to the end of June, *Max von zur Mühlen*); most of the examples I have seen from this locality pertain to the var. *frigidus*, but the typical condition is also represented.

Limnophilus rhombicus, p. 48, and Supplement, p. xvii.—On August 12th, 1880, I found a ♀ example at the Statzer-See, near St. Moritz, Upper Engadine, Switzerland, at the great elevation of nearly 6000 ft. (*cf.* Ent. Mo. Mag., xvii, p. 219).

A very singular example was taken by De Selys-Longchamps at a little lake close to the Simplon Hospice (about 6000 ft.), in July. The dark portions of the anterior-wings are very greatly pronounced, the only pale portions being the anterior margin and the two ordinary spaces. The example is a ♀, and has the appendages perfectly linear (without any basal dilatation), but such a condition is not very unusual.

Limnophilus subcentralis, p. 64, and Supplement, p. xviii.—Add Scotland (Aviemore and Kinardochie, *J. J. King*; Loch Awe, *Cameron*).

Limnophilus decipiens, p. 53.—Add Livonia (*Max von zur Mühlen*).

Limnophilus marmoratus, p. 54.—2 ♂ and 2 ♀ from Central Italy (Massa di Faitello, Apennino Pistoiese, about 4600 ft., 1st August, *Eaton*) have the colours, &c., as in the *var. nobilis* (p. 55), and the form of the anal appendages in both sexes shows divergence from the type-form to a rather serious extent, yet I dare not consider this divergence of specific importance. The most important differences are these:—In the ♂ the superior appendages appear to be narrower, the inturned apical margin with stronger teeth, and there are two very strong teeth at the lower angle of this margin (usually one only, sometimes divided into two smaller, in the type-form). In the ♀ the appendages are longer, the apices more produced, longer than the tubular piece (usually shorter than it in the type-form).

Limnophilus flavo-spinosus, p. 59.—Add Italy (Massa di Faitello, Apennino Pistoiese, about 4600 ft., 1st August, *Eaton*, 2 ♂; Pescia, *Desideri*, several examples in the Florence Museum).

Limnophilus correptus, Supplement, p. xviii.—I possess a ♀ of this from Japan (Hakodaté, 24th September, *G. Lewis*). The ♂ remains unknown.

Limnophilus lunatus, p. 61, and Supplement, pp. vi and xviii.—5 ♂ and 1 ♀ from Central Italy (Massa di Faitello, Apennino Pistoiese, about 4600 ft., 1st August, *Eaton*) are of the rich yellow form already noticed from Carinthia, Asia Minor, &c. In two of them the pale fenestrated spot, anastomosal space, and lunate apical space, are scarcely indicated, and thus are nearly similar to the type of *L. flavidus*, Ramb., from Barcelona, which I have already united with *lunatus*.

A ♂ from the Island of Sardinia (*Costa*) resembles the pale form in colour, but from the structure of the superior and intermediate appendages, I think it possible that it pertains to a new species; more materials are necessary.

Limnophilus germanus, p. 63, and Supplement, p. vi.—Add to the localities:—Switzerland (Altstetten, near Zürich, *Paul*, 7th October).

I have seen 3 ♂ and 1 ♀ from the above-named locality. The males are of the usual size; one of them is a strongly-marked variety, in which the pterostigma in the anterior-wings is large and deep black, and the posterior have a distinct dark pterostigmatic spot, and the apex clouded with grey: the female expands to 33 mm., and has the anterior-wings almost uniformly fulvescent, with faintly darker pterostigma and only faint indication of the pale apical lunate space.

Limnophilus submaculatus, p. 67, and Supplement, p. xix.—Occurs in the mountains of the Vosges (Géradmer and Retournemer, *Cuny* and *McLachlan*).

Limnophilus fuscinervis, p. 74, and Supplement, pp. vi and xx.—Add Livonia (very common, *Max von zur Mühlen*).

Limnophilus nigriceps, p. 77, and Supplement, p. xxi.—Add Livonia (Dorpat and Oberpahlen, *Max von zur Mühlen*).

Limnophilus picturatus, p. 78, and Supplement, p. xxi.—Add Livonia (*Max von zur Mühlen*), thus indicating a more southern distribution than appeared probable. The example seen by me is a very characteristically-marked ♀, of large size (expanse, 25 mm.). River Kouda, N.W. Siberia (*N. Sundmann*, 1 ♀).

Limnophilus centralis, p. 79, *var. italicus* (*n. sp. ?*).—From Central Italy (Lago Nero, Apennino Pistoiese, 5530 ft., 2nd August, *Eaton*) I have 2 ♂ and 3 ♀ altogether resembling *L. centralis* in general characters; but in the ♂ the apex of the inferior appendages is nearly furcate if viewed laterally, and excavated if viewed in front, and the apices of the opposing appendages are not pressed together as is apparently invariably the case in dried specimens of *centralis*; moreover, the tips of the intermediate appendages appear to be turned downward instead of upward.

I am much inclined to think these represent a good and distinct species, but have adopted the more cautious course of considering them only a variety, pending examination of further examples from the same locality, or from other parts of Central and Southern Italy.

PLATE I.—Fig. 1, apex of abdomen of ♂, above; 2, same from side; 3, apex of an inferior appendage from side (more enlarged); 4, same in front (ditto).

Limnophilus despectus, p. 90, and Supplement, pp. vii and xxiii.—Add Livonia (not rare, *Max von zur Mühlen*); also Switzerland (Statzer-See and Val Bevers, Upper Engadine, Augt., about 6000 ft., *McLachlan*, 2 ♀, *cf.* Ent. Mo. Mag., xvii, p. 219; this is an additional example of the affinity of the alpine and boreal faunæ).

Limnophilus diphyes, Supplement, p. xxiii.—Add Finland (Jaakkima, *J. Sahlberg*, rather common); therefore the species forms part of the Fauna of Europe proper; the examples do not vary from those found in Siberia.

Anabolia nervosa, var. excisa.

A. excisa, Hag., Verh. zool.-bot. Gesell. Wien, 1864, 803 (not described); cf. McLach., Revision and Synopsis, Suppl., viii.

Dr. Hagen previously informed me that he thought the specimen from "France," on which this name was bestowed, might be only a ♂ *nervosa* with malformed appendages. He has since kindly forwarded the specimen. I think it is not distinct from *nervosa*, but the appendages do not appear to me to be *malformed*, and it perhaps represents a local form not otherwise known. The principal character lies in the superior appendages, which have a *distinct excised apical edge*, immediately below which the lower edge is very deeply excised (see the figure).

PLATE I.—Fig. 1, apex of abdomen of ♂ from side.

N.B.—The superior appendages of *A. nervosa* have a black tooth proceeding from an internal ridge close to the upper edge near the middle; but it is not always visible unless viewed from beneath.

Anabolia nervosa, var. Putoni (n. sp.?).

A. sp. n., McLach., Revue d'Entomologie, iii, 1884 (not described).

My friend Dr. Puton gave me a pair (♂ ♀) of an *Anabolia* taken by him near Remiremont, Vosges, France. They are of medium size, and rather pale in colour. The superior appendages of the ♂ are very peculiar in form (see figure), having a *long straight* (or slightly excised) *apical edge*, below which the lower edge is deeply and regularly excised. (The penis-sheaths and penis are much exerted in this individual, but probably accidentally). All the parts are symmetrical, and do not appear to be malformed. Either a very strongly-marked form of *A. nervosa* is here represented, or a new species. The small examples from Saxony (cf. Rev. and Synops., p. 105) perhaps show a slight approach to a similar formation.

PLATE I.—Fig. 1, apex of abdomen of ♂ from side (the intermediate appendages, penis-sheaths, &c., purposely omitted).

N.B.—Very great caution should be exercised with regard to the species of *Anabolia*. I am convinced that variation in the anal parts of the ♂ exists to a considerable extent, from local causes.

Anisogamus difformis, p. 109.—A very large ♂ (expanse, 29 mm.) from North Italy (Tonale Pass, 5240 ft., 30th July, *Eaton*) appears to belong here, as likewise do two ♂ from the Italian foot of Monte Rosa (above Macugnaga, 5300 ft., 15th July, *McLachlan*) that are still larger (expanse, 30½ mm.). A slightly smaller ♂ occurred in the Val Bedretto, Canton Ticino, on July 22nd (*McLachlan*).

Acrophylax zerberus, p. 111, and Supplement, p. xxv.—Dr. Schoch submitted to me examples in the Zürich Museum, from Flüela, Switzerland, *very remarkable for their greatly abbreviated wings*. Were it not that the amount of abbreviation varies in different individuals, this form would certainly be worthy of being distinguished by a distinct varietal name, and it occurs in both sexes. In one example the anterior-wings are about 11 mm. long, and, therefore, almost normal; in others the length varies from 6 to 9 mm., and in these the wings must have been nearly useless as organs of flight, though no particular abnormal condition of the neurulation is observable, other than shortening of the apical cellules. *A. zerberus* is especially an insect of great altitudes, and these individuals exemplify a tendency frequently seen in inhabitants of high mountains, or the high north.

I have now no doubt that the very large examples mentioned at p. 112 are only individuals of the same species varying in just the opposite direction.

Asynarchus cœnosus, p. 117, and Supplement, pp. ix and xxxi.—As the variation in this insect is due to local conditions, to some extent, it may be advisable to accept three principal varietal forms; but they distinctly merge into each other.

1. **cœnosus** (Curt., type-form). The smallest condition; the anterior-wings shining greyish, ordinarily without paler or darker markings, save that the pale spot at the termination of the 7th apical sector is more or less indicated.

This is the British form, occurring on elevated moors in the north of England and in Scotland. It has latterly become better known in Britain, and some examples from Clydesdale (*K. J. Morton*) show traces of darker variation on the wings.

2. **var. arcticus** (Kol.). Ordinarily considerably larger, the anterior-wings apparently more pubescent, darker grey, less shining, and more or less varied with whitish.

The ordinary form on the mountains of continental Europe. The size varies considerably (chiefly according to locality), and some individuals from Finland are scarcely to be distinguished, either in size or colour, from the type-form.

3. **var. paludum** (Kol.). Size as in var. 2, but equally liable to vary. Very dark, the anterior-wings being nearly black in life with the ordinary pale (white or yellow) spots very conspicuous, and sometimes with pale freckles.

The form from the Altvater Mountains; it also occurs, apparently exclusively, on the mountains of the Vosges, in France (Gérardmer, *McLachlan*). A very distinct looking insect from the type-form, but, just as some examples of the latter show a tendency to approach var. 2, so do some individuals of var. 2 approach var. 3.

I am quite of the opinion that it will ultimately be possible to thoroughly connect the forms, both in size and colour; indeed, this is almost possible now, from the materials in my own collection.

Stenophylax dubius, p. 124, and Supplement, p. x.—Add Finland (Teisko, *J. Sahlberg*, 2 ♂). This species continues very rare, and the ♀ is yet unknown.

Stenophylax rotundipennis, p. 126, and Supplement, p. xxxiv.—Add Belgium (Tilff, *Föttinger*, 1 ♀ in the Brussels Museum); Scotland (Carluke, Clyde District, *Morton*, 1 ♂, 1 ♀, cf. King, Ent. Mo. Mag., xviii, 163).

Stenophylax nigricornis, p. 127, and Supplement, pp. x and xxxiv.—Add Belgium (Rouge Cloître, June and July, *De Bormans*, common).

Stenophylax speluncarum, p. 136.—One ♀ from France (Grotte d'Echenoz, Haute Saône, *Puton*) perhaps belongs here, but it is necessary to see the ♂ from the same locality.

Stenophylax mucronatus, Addenda, p. lxxxiv.—I have seen two further ♂ examples from Zürich, in the collection of the Entomological Museum of the Polytechnic of that city; one of them is rather larger (expanse, 38 mm.) than the original type. A ♀ from the same place is in my collection.

In the ♀ (dried) the 9th dorsal segment is very narrow (contracted under the 8th). Tubular piece formed superiorly of two nearly contiguous, slender, lanceolate, and acute testaceous valves, and a truncate obtuse hairy lower portion, which is one-half shorter. Side-pieces of 9th ventral segment obtusely conical. Vulvar-scale having a short, obtuse, thickened middle lobe; side lobes distant, smaller, curved and sub-acute. No distinct ventral teeth.

PLATE I.—Fig. 1, apex of abdomen of ♀, above; 2, same, from side; 3, vulvar-scale.

Stenophylax crossotus (*n. sp.*).

Body (including antennæ, palpi, and legs) reddish-testaceous; sides of mesonotum brownish or fuscous; hairs of head and pronotum reddish-testaceous; spines of tibiæ and tarsi black. Anterior-wings long and narrow, very elongately parabolic at the apex, *pale grey* sprinkled with small whitish irrorations; the costal margin as far as the radius, and the sutural area, pale; fenestrate spot and anastomosal space large and very distinct, whitish; membrane slightly granulose, clothed with rather long adpressed greyish pubescence; costal margin in more than its basal half furnished with a dense fringe of rather long pale greyish (or whitish) silky hairs, each hair straight, but bent at its end and directed toward the apex: neuration pale, set with black hairs, which are long and strong on the post-costa and its branches; discoidal cell rather short, not so long as its footstalk, excised on its upper edge. Posterior-wings whitish, sub-opaque: neuration pale; discoidal cell long and narrow, the upper branch of the cubitus furcating almost on a level with its commencement (or very slightly beyond).

In the ♂ the margin of the last dorsal segment is regular, very slightly inturned, the apex of the segment slightly scabrous and blackish, but having a median pale space. Superior appendages concealed in the cavity of the segment, flattened, somewhat pyriform, with the inner edge excised. Intermediate appendages dilated at the base, but afterwards each forms a very strongly divergent, curved, piceous spine. Inferior appendages short, very broad, flattened, the apex truncate, thickened, and curved, so as to appear slightly excised. Penis-sheaths spiniform, testaceous. Penis short, slender, testaceous. A series of minute teeth on the 6th to 8th ventral segments, those on the 7th coarser and larger.

♀ unknown.

Length of body, 13½—15 mm. Expanse, 41—45 mm.

Corsica (2 ♂ from the Zürich Museum, one of which was generously presented to me).

Belongs to the typical group of *S. concentricus*, but very distinct by the narrower anterior-wings (and their colour) in which the two ordinary pale

spaces are very conspicuous; and especially by the *peculiar costal fringe* of these wings, of which there are also indications in *S. mucronatus*; it is probably present only in the ♂. The anal parts are much concealed, but conform to the *concentricus* general type.

PLATE I.—Fig. 1, portion of costal nervure of anterior-wing, with fringe; 2, apex of abdomen of ♂, in front (diagrammatic); 3, superior and intermediate appendages, seen internally, somewhat from side.

MESOPHYLAX.

McLach., Journ. Linn. Soc., Zoology, xvi, 157 (1882), = *Stenophylax*, *partim*, *olim*.

Very closely allied to *Stenophylax* typically; differs especially in the spur of the anterior tibiæ of the ♂ being so much reduced as to have become microscopic, whereas, the corresponding spur in the ♀ is long; but the first joint of these tarsi in the ♂ is as long as in the ♀. Palpi rather more slender. Pronotum more developed. Median lobe of the vulvar-scale in ♀ notched or bifid (so far as is known).

These characters must be regarded as comparative only with the *typical group* of *Stenophylax*.

This genus was formed with the idea of easing the overweighted genus *Stenophylax*, influenced by the discovery of the virtually obsolete condition of the spur on the ♂ anterior tibiæ in *S. aspersus*, and the further discovery that *S. oblitus* (in which I had already called attention to this peculiarity, *vide* p. 116) is allied thereto, and will fall into the same genus.

The species are as follows:—

Mesophylax aspersus.

Synonymy and bibliography at p. 132, add: *M. aspersus*, McLach., Journ. Linn. Soc., Zoology, xvi, 157.

var. canariensis, McLach., *loc. cit.*

Apparently differing from the type-form only in its very small size (expanse, ♂, 22—25 mm.). [The superior and intermediate appendages not in a condition suitable for examination].

Canary Islands (hills beyond San Mateo, Grand Canary, 4550—4650 ft., 11th December, *Eaton*, 2 ♂).

The size and locality render it possible that this may prove a distinct insular form; but it is necessary to remark that I possess a typical ♂ from North Spain that expands to only 26 mm.

Notes on larvæ and cases that possibly belong to the Canarian form are to be found appended to those on the perfect insect at *loc. cit.*

Mesophylax impunctatus (n. sp.).

Stenophylax aspersus, Meyer-Dür, Mitth. schw. ent. Gesell., vi, 3 9, *nec* Rbr. (noticed).

Almost entirely agreeing with *M. aspersus* in form and size (the ♀ sometimes very large; 44 mm.), but much paler in colour. Body testaceous; the sides of the mesonotum usually fuscous or blackish. Antennæ and legs yellowish. Anterior-wings pale greyish-testaceous, with scattered indistinct paler irrorations: neuration mostly reddish-testaceous (*without dark spaces*). Posterior-wings whitish: neuration pale.

In the ♂ the anal parts are mostly as in *aspersus*, but with the following distinct differences. The inferior appendages are longer and much more slender (nearly straight, or scarcely geniculate), and without any marked angular dilatation of the lower edge (which is always conspicuous in *aspersus*). Penis-sheaths with only one tooth before the prolonged apex.

Switzerland (near Zürich, apparently not uncommon, and in other localities); Lago di Como; Bavaria.

I have seen a ♂ from Scotland (Dumfriesshire, *Service*), and know not how to account for its presence there. *cf.* King, Ent. Mo. Mag., xx, pp. 19, 20, indicated as *M. aspersus*, *var.*

After a careful study, with more materials, I am convinced that this is specifically distinct from *M. aspersus*. The colour-differences are considerable, the insect being much paler, and without the alternate dark and light spaces on the neururation so conspicuous in *aspersus* (especially on the apical sectors). Moreover, there appear to be very sufficient structural differences in the anal parts of the ♂ (similar differences in the ♀ are not at present certain).

It is probably not so decidedly a meridional insect as is *M. aspersus*. To it no doubt belongs the "*Stenophylax* No. 7," noticed by Hagen in Stett. Zeit., 1859, p. 133, from Bavaria (*cf.* Rev. and Synop., p. 133), and also the ♀ from Como referred to at Supplement, p. xxxiv. I have seen no example indicated as having been found in a cave (a very common habitat with *M. aspersus*).

PLATE 1—Fig. 1, apex of abdomen of ♂ from side; 2, inferior appendage from another example; 3, apex of a penis-sheath (much enlarged).

Mesophylax oblitus.

To the bibliography given at p. 115, add: *M. oblitus*, McLach., Journ. Linn. Soc., Zoology, xvi, 158.

Micropterna Muehleni (*n. sp.*).

Much resembling a small example of *M. testacea*, and of the same slender form. Body, antennæ, palpi, and legs pale testaceous (the latter with black spines); side lobes of mesonotum blackish, and there is a blackish spot on each side of the metanotum. Basal joint of anterior tarsi of ♂ *three-fourths the length of the second*. Anterior-wings narrow, very pale greyish with a slight testaceous tinge, rather thickly sprinkled with indistinct small paler dots: neururation pale. Posterior-wings whitish, with pale neururation.

In the ♂ the margin of the last dorsal segment is excised; on each side of the middle is a patch of minute blackish setæ, which are less numerous in the middle (somewhat as in *M. nycterobia*); seen in front the margin is broadly inturned, with very sparse minute blackish setæ. Superior appendages scarcely visible externally; seen in front they are large, ear-shaped, concave and blackish (excepting in the centre). Intermediate appendages spiniform, stout, curved outwards, dark reddish-testaceous. Inferior appendages not visible laterally; seen in front they occupy nearly the whole of the sides of the cavity of the segment, and each ends in a band-shaped obliquely truncate process, whereof the lower angle is slightly produced. Sheaths short, slender, spiniform, reddish-testaceous. Penis slightly shorter and more slender than the sheaths, straight and spiniform. No ventral teeth.

♀ unknown.

Length of body, 9½ mm. Expanse, 28 mm.

North Persia (1 ♂ in Max von zur Mühlen's collection).

At first sight this is so like *M. testacea* that it might readily be confounded therewith; but examination reveals different anal structure, and a remarkable diversity therefrom in the form of the first anterior tarsal joint in the ♂, which is even longer than in *M. lateralis*. If my abandoned genus "*Hemipterna*" be ever resuscitated (*cf.* Supplement, p. xxxv, foot-note) this should find a place therein, rather than in *Micropterna* as represented by *nycterobia* and *testacea*.

PLATE I.—Fig. 1, basal and second joints of anterior tarsi of ♂; 2, apex of abdomen of ♂, above; 3, same in front (in outline).

Micropterna lateralis, p. 142, and Supplement, p. x.—I found the remains of a ♂ in a spider's web at the Lake of Gérardmer, Vosges, France, agreeing more exactly with the usual British condition than does any individual I had previously seen from the Continent.

Platyphylax Frauenfeldi, p. 143, and Supplement, p. xxxvi.—In the Zürich Museum is a ♀ from Naples that agrees sufficiently with the Austrian type in my collection; it is larger (expanse, 48 mm.). I am still not in a position to form any decided opinion as to the distinctness of *Frauenfeldi* and *pallescens*, having seen no further materials of the latter. In the description of the posterior-wings of *Frauenfeldi* it would perhaps be more correct to say that the upper branch of the cubitus furcates on a level with (instead of "slightly before") the commencement of the discoidal cell. I have not yet seen the ♂ of *Frauenfeldi*, if *pallescens* be really distinct. At present these insects appear to be of extreme rarity.

Halesus radiatus, p. 148 (*partim*), and Supplement, p. xxxvii.—Examples from Norway (Dovre, *J. Sahlberg*) appear to agree entirely (*cf.* Suppl., p. xxxvii) with others from Britain.

Halesus digitatus, p. 150.—Certainly occurs in Switzerland. I found a ♂ example in the Upper Engadine in August.

Halesus ruficollis, p. 152, and Supplement, p. xxxvii.—Common in the Upper Engadine, Switzerland, in August (*McLachlan*); also France (Samoëns, Savoy, September, *Eaton*).

I have now grave doubts as to the distinctness of *H. mæstus* (p. 159), but do not refer it here as a synonym in the absence of males from the quarter in which the original type was found: possibly the *var. melancholicus* (p. 153) will prove to belong here. The examples from Savoy referred to *mæstus* at Supplement, p. xxxix, are, I am now sure, identical with *ruficollis*.

Halesus antennatus, p. 153, **hilaris**, p. 154, and **uncatus**, p. 155.—From Corsica (*Damry*) I have a pair (♂ ♀) of an insect agreeing with *antennatus* and *hilaris* in colour, and more especially with *antennatus* (also in size), save in the colour of the antennæ, which are not black. In the form of the second joint of the inferior appendages of the ♂ it is nearer (without being altogether

similar) to *uncatus* than to *hilaris*. This group of species evidently requires careful study from abundant materials. I refrain from bestowing a name upon the Corsican insect.

H. uncatus from Venetia (Belluno) is in the Florence Museum.

Halesus ligonifer, p. 155.—From the Moselle at Remiremont, Vosges (*Puton*, end of October and beginning of November), I have before me 10 ♂ and 3 ♀ of a species that I have no hesitation in identifying with *H. ligonifer*, McLach., although the original ♀ type is no longer in my hands. The original description needs only slight modification.

The anterior-wings are more or less clouded with greyish-brown (enclosing pale irrorations) in the apical and dorsal regions; the two usual pale spaces large, much more strongly indicated in some individuals than in others.

In the ♂ the last dorsal segment is regular, its apical edge broadly testaceous. Appendages sunk in the cavity of the apex, excepting the inferior, and the penis and sheaths. Superior appendages large, ear-shaped, concave internally, their outer edge regularly rounded and testaceous. Intermediate appendages concealed, apparently long and slender, arising from a basal piece, which has a large triangular tooth on either side, and a long and broad tongue-shaped plate in the middle below the appendages. Inferior appendages very prominent, upturned, testaceous, the apex obliquely truncate, so that the lower edge is shorter than the upper, fringed with long testaceous hairs; internally concave, and before the superior angle of the apex is a small lanceolate tooth (the point of which is sometimes visible externally). Penis large and complicated; the apex of the chitinous portion broad, each angle produced into a sharp piceous tooth; but extending along this broad apex, and apparently continued to the base above, is a more slender whitish membranous portion, notched at the apex; above, before the base, is a broad chitinous portion, separable from the other, but apparently articulated to it, each angle of which is produced into a sharp piceous tooth. Penis-sheaths consisting of a stout cylindrical basal portion, at the apex of which are one or two small short spines, and three or four very long spines strongly curved at the tips. A few small teeth on the 6th and 7th ventral segments.

In the ♀ the vulvar-scale perhaps consists of thick, broad, obtuse side-lobes, the middle lobe being apparently obsolete (not quite certain).

Expanse, 34—38 mm.

Although this species, by its coloration, seems allied to *H. uncatus* and *hilaris*, I think it is structurally nearer *H. Melampus*; the inferior appendages want the second joint that is so characteristic of *uncatus*, &c., but the internal tooth possibly represents it in a rudimentary condition. It is evidently a late autumnal insect, like so many of its congeners.

PLATE I.—Fig. 1, apex of abdomen of ♂, from side; 2, inferior appendage, internally (ditto); 3, apex of penis, from above (ditto); 4, same beneath (ditto); 5, penis and sheaths, from side (ditto), taken from an example in which the two portions of the organ are widely separated in drying.

Catadice estrellensis (n. sp.).

Blackish; superior orbits, warts of head and pronotum, and impressed lines of mesonotum, reddish, as are also the lateral lines of abdomen and the margins of abdominal segments beneath (abdomen of ♀ probably nearly wholly reddish in life); clothing golden-yellow. Antennæ fuscous, strongly annulated with reddish (or reddish, annulated with fuscous, in the ♀). Palpi dusky testaceous. Legs testaceous; coxæ blackish; femora somewhat dusky; tips of tibiæ and of tarsal joints, blackish; spines black. Anterior-wings elongate, grey with a yellowish tinge, rather thickly irrorated with small cinereous spots, caused by the pubescence, which is otherwise

blackish; pterostigma slightly obscure; an elongate whitish-hyaline spot at the thyridium, and a smaller one at the areculus; fringes very short, blackish: neuration fuscous, almost hairless, excepting at the base; discoidal cell narrow, rather larger than its footstalk. Posterior-wings whitish-grey with dusky neuration; pubescence blackish, almost microscopic: fringes darker grey and very short; discoidal cell as in the anterior; upper branch of cubitus furcating beyond the level of the commencement of the discoidal cell.

In the ♂ the last dorsal segment carries long golden hairs; its middle is scabrous and intensely black, this portion being dilated and somewhat produced anteriorly, and on either side of it is a marginal pale space. Superior appendages very small, testaceous, the outer edge broad and oblique, fringed with pale hairs. Intermediate appendages not separable if viewed from above; black, straight, flattened and elongately triangular if viewed laterally. Inferior appendages broad, incurved, very obtuse, inserted close together on the ventral margin, concave within, dusky testaceous, scabrous and black at the tips. Penis very slender, short, straight, yellowish, notched at the tip.

In the ♀ the anal parts are reddish-testaceous; the last dorsal segment with a sub-marginal fringe of long golden hairs. Tubular-piece, viewed from above, formed of two triangular acute portions with a deep triangular excision between them, the base dilated and rounded externally at each side; below it is a thick, oblong, horizontal plate, the apical surface of which is shallowly excavated. Vulvar-scale with laterally elongate, triangular, flattened side lobes, and a shorter cylindrical middle lobe.

Length of body, ♂, 8—9½ mm.; ♀, 10—11 mm. Expanse, ♂, 26—27 mm.; ♀, 28—30 mm.

Portugal (Stream south of Sabugueiro, Beira Baixa, 4092 ft., 5th June, *Eaton*, 3 ♂, 3 ♀).

Larger, darker, and more robust than *C. Bolivari*, differing also in the form of the intermediate appendages of the ♂, &c.

It should be noted that it is scarcely correct to say that *Catadice* has no "pouch" in the posterior-wings of the ♂ (*cf.* Supplement, p. xl); there are indications of a very short pouch, but it has no pencil of hairs in it, and hence is scarcely evident.

PLATE I.—Fig. 1, apex of abdomen of ♂, above; 2, same, from side; 3, same, beneath; 4, same of ♀, above; 5, same, from side.

Drusus discolor, p. 168, and Supplement, p. xlii.—Add Central Italy (Pian dei Sisi, about 3600 ft., 31st July, and Valle Sestajone, about 5000 ft., 2nd August, Apennino Pistoiese, *Eaton*, 6 ♂, 1 ♀). These examples are of small size, and decidedly paler in colour when viewed in connection with a long series from the Alps, &c.

Drusus trifidus, p. 171.—It would seem that occasionally (owing to mode of killing?) the three projections of the margin of the last dorsal segment in the ♂ are liable to be turned under, so that the margin appears to be truncate. This is distinctly noticeable in the majority of examples taken by me near Pontresina, Engadine, and to such an extent that it was some time before I could be convinced they did not represent a new species (especially as they are also of very small size); but in others, from the same locality, the usual trifid condition of the segment is indicated, but not strongly. I think this is only the mechanical result of drying, yet it is curious that all the examples from the locality do not show clearly the character whence the name of the species was derived.

Monocentra improvisa (n. sp.).

The ♂ without "scales" on the wings, excepting in the "pouch" of the posterior pair.

Black, with black hairs. Warts of pronotum (which are oval and very large) and wing-callosities reddish, with black hairs. Abdomen paler beneath. Antennæ blackish-fuscous, the basal joint black. Palpi greyish-testaceous, fuscous outwardly. Legs dingy testaceous; coxæ blackish; femora fuscous outwardly, excepting at the apex, which remains pale; posterior tibiæ fuscous outwardly in their apical half, excepting the extreme apex. Anterior-wings uniformly pale smoky-grey, slightly shining, and faintly olivaceous; membrane clothed with regular adpressed ordinary blackish pubescence: neuration greyish-testaceous, with strong black hairs at the extreme base, and on the lower cubitus and post-costa; discoidal cell about the length of its footstalk, rather broad: a short whitish line at thyridium and areculus. Posterior-wings pale fuliginous, occasionally with very faint pale irroration in the costal portion; pubescence of membrane slight, blackish; a small whitish linear spot at the base of the 5th apical cell: neuration fuscous; discoidal cell longer than its footstalk, the upper branch of cubitus furcating on a level with its middle: *these wings in the ♂ have a very deep pouch, ending considerably before the margin, in which are whitish waxy-looking scales, arranged in several series on either side, and directed outward.*

In the ♂ the margin of the last dorsal segment has a large black roughened median space (with a pale space on either side), the apical margin of which is nearly truncate, slightly rolled inward. Superior appendages ovate, testaceous, varying in degree of exertion. Intermediate appendages broad at the base and testaceous, afterwards narrowing, the tips turned upward, black and sub-truncate. Inferior appendages large and broad, nearly ovate, widely divergent, obtuse, concave above, up-turned if viewed laterally, testaceous with darker tips. Penis very slender, straight, testaceous, slightly emarginate at the tip.

In the ♀ the anal parts are testaceous; the 8th dorsal segment provided with long black hairs; the 9th narrow. Tubular-piece with a very deep excision above; the side pieces, viewed from above, somewhat triangular, acute, fringed; beneath it is a nearly vertical oblong plate. Vulvar-scale with long, slightly curved, obtuse, thickened side lobes, and a nearly equally long, more slender, middle lobe.

Length of body, $4\frac{1}{2}$ —6 mm. Expanse, 15—19 mm. The smallest and largest examples are both ♀.

Apeninno Pistoiese, Central Italy (Near Boscolungo, 3760 ft., 31st July, Slopes of Serra Fariola, 5600 ft., 1st August, and Valle Sestajone, over 4000 ft., 2nd August, *Eaton*, 4 ♂, 5 ♀).

This interesting species has the size and facies of *Drusus trifidus*. It is a *Monocentra* to the extent that the pouch of the posterior-wings of the male is furnished with scales (of the same nature as in *M. lepidoptera*, but shorter, and the pouch does not extend so far towards the margin), but the membrane in both pairs of wings has only the ordinary pubescence. From the presence of "scales" on any portion of the wings I consider it a *Monocentra*; the anal parts are quite analogous to those of *M. lepidoptera* and also to those of *Drusus annulatus* and *Peltostomis sudetica* and *græca*, the whole of which form a natural group on this character, although differing in spur-formulæ, and in the presence or absence of "scales."

PLATE I.—Fig. 1, pouch of posterior-wing of ♂, open, and very much enlarged; 2, "scales" in pouch, still more enlarged; 3, discoidal cell of anterior-wings; 4, last dorsal segment of ♂, above; 5, inferior appendage, and penis, above (in outline); 6, apex of abdomen of ♂, from side; 7, same of ♀, above; 8, same, from side.

Chilostigma præteritum, Supplement, p. xlii.—I have seen numerous examples of both sexes from Arctic Eastern Siberia, collected during the "Vega"

expedition in 1879 (Pitlekaj and vicinity, lat. 67° N., long. 173° W., July, *Nordenskiöld*). These vary much in size (expanse, 19—25 mm.), irrespective of sex; I subjoin further descriptive notes:—

In both sexes the veinlet connecting the radius and sub-costa near the end of the latter in the anterior-wings is sometimes absent, or, at any rate, ill-defined. In the ♀ the anterior-wings are usually clouded with brown all over (with pale irrorations), but leaving a large, pale, irregularly quadrate, fenestrate spot, a smaller spot at the thyridium, and a more or less distinct and large anastomosal space.

In the ♂ the part indicated as the “penis” (p. xliii) is really the lower penis-cover, which is whitish, and its apex forms two regular dilated lobes, separated by a small excision of the apical margin; in this lie two shorter, slender, piceous, slightly curved sheaths, and the still shorter, slender penis, which is seldom visible.

In the ♀ the 9th dorsal segment is small and narrow. Appendages in the form of two rather large, sub-contiguous, hairy, oval lobes, below which is a sub-quadrate horizontal plate. Vulvar-scale with broad thick side-lobes (no apparent middle lobe). No ventral teeth.

PLATE I.—Fig. 1, inferior appendages of ♂, with lower penis-cover and sheath (exserted), from side; 2, inferior appendages and lower penis-cover (exserted), beneath; 3, apex of abdomen of ♀, above; 4, same, from side (figs. 3 and 4 from an example in alcohol).

Chætopteryx villosa, p. 193.—An extended examination of a very large number of examples induces me to believe that the anal parts of both sexes are liable to slight variation: in the ♂ chiefly in the form of the superior appendages (but all the parts shew tendency to modification); in the ♀ the “tubular piece” occasionally tends to assume the form as figured for *Ch. Sahlbergi*, even in individuals from the same precise locality. In a very long series from the Vosges (Remiremont, *Puton*, beginning of November) the colour is darker than usual, in this respect approaching *Ch. fusca*.

Chætopteryx obscurata, p. 196, and Supplement, p. xliii.—Add France (the Moselle at Remiremont, Vosges, end of October and beginning of November, 3 ♂, 2 ♀, *Puton*; cf. *Revue d'Entomologie*, iii, p. 12).

In the ♀ the 9th dorsal segment and the tubular piece are scarcely separable; the former apparently forming a broad triangle, the latter short, its outer edge oblique on either side, with a deep semicircular median excision leaving prominent lateral angles; beneath this is a cavity, and then succeeds a shining testaceous portion of the apical structure forming a nearly circular concave plate above, the edge of which is thickened and darker; below this again is an oblong piece of same texture and colour. Side-pieces of 9th ventral segment small, triangular at the apex. Vulvar-scale large, divided into two large, distant, thick, and obtuse side-lobes, and a very small and short triangular middle lobe. A few small teeth on the 6th and 7th ventral segments.

Length of body, ♀, 11—11½ mm. Expanse, 27—28 mm.

Except in being slightly larger, with much longer abdomen, the ♀ does not differ in appearance from the ♂, and has the same elongate wings. The anal structure in the ♀ is somewhat aberrant.

PLATE I.—Fig. 1, apex of abdomen of ♀, above; 2, same, from side; 3, vulvar scale, beneath.

Chætopterygopsis Maclachlani, p. 200.—Add France (the Moselle at Remiremont, Vosges, October 31st and November 16th, *Puton*, 2 ♂, 2 ♀; very slightly larger than the typical form from the Altvater and Saxony; smaller than the “forma major” from Austria).

Enoicyla amœna, p. 208.—In the Zürich Museum were three ♂ examples (one of which has been generously presented to me) of an *Enoicyla* from Switzerland (Biberbrücke, Canton Schwyz, 16th September, *Paul*) that appear to me to be undoubtedly *E. amœna*. I subjoin a description:—

Body black above; pronotum, &c., scutellum of meso- and meta-nota, posterior margins of abdominal segments, and the terminal segment almost entirely, paler, reddish: hairs of head and pronotum black, sparse and rather long. Antennæ blackish-fuscous, the basal joint distinctly black. Palpi yellowish-testaceous; the apex of the terminal joint of maxillary pair scarcely darker; last joint of labial pair fuscous. Legs yellowish-testaceous; coxæ black; posterior tibiæ above, excepting at the base, fuscous; tarsi (excepting the basal joint) fuscous, the posterior distinctly black. Anterior-wings with broad rounded apices; very pale grey, membrane finely granulose under a lens, slightly clothed with yellowish pubescence: neuration rather fine, fuscous, the apical sectors and anastomosis blacker, furnished with rather long black hairs; 5th apical cellule with a very short footstalk. Posterior-wings paler, with slight yellowish-grey pubescence and fringes: neuration fuscous; all the apical cellules extending to the anastomosis (in the examples before me).

In the ♂ the margin of the last dorsal segment has a small rounded inturned flap in the middle, furnished with short black setæ. Superior appendages scarcely visible, impressed and ear-shaped. Intermediate appendages in the form of long, lanceolate, acute, divergent, slightly curved testaceous blades. Inferior appendages forming broad flaps, the extremity of which is sometimes slightly produced (as in my figure) and slightly granulose, with dark hairs. Viewed in front the apical cavity is yellowish- or reddish-testaceous.

♀ unknown.

Length of body, ♂, $3\frac{3}{4}$ —4 mm. Expanse, 15—17 mm.

The above agrees in the main with Hagen's brief description, which was no doubt taken from a rubbed individual. The only discrepancy is in the colour of the palpi, which is really not of much importance.

I think that Hagen's *Enoicyla* from Western Germany (pp. 208, 209) may be assumed to be identical with *amœna*.

In size, and general form and structure, *amœna* is related to *Costæ*, but the latter is paler, with more densely pubescent wings, and *very different inferior appendages*.

PLATE II.—Fig. 1, apex of abdomen of ♂, from side (the inferior appendages are not so much produced in the other examples, the apical portion being more inturned).

Apatania stigmatella, p. 213.—Add Finland (Jaakkima, *J. Sahlberg*).

Fam. SERICOSTOMATIDÆ.

The indication of "Sections," or divisions, by *numerals*, adopted in the "Revision and Synopsis," is liable to inconvenience; I, therefore, propose to designate these according to the most typical genus in each, thus:—

Section of SERICOSTOMA	(= Section i, p. 222).
„ „ SILO	(= „ ii, p. 239).
„ „ BRACHYCENTRUS	(= „ iii, p. 253).
„ „ LEPIDOSTOMA	(= „ iv, p. 270).

SERICOSTOMA, p. 223.

Since the last Supplement was published (June, 1880), I have lost no opportunity of amassing materials for this genus during my excursions, and my friend the Rev. A. E. Eaton has aided me by doing the same in the course of his travels. On the other hand, some of the original materials are no longer available, having been returned to the various owners. I find it necessary to attempt a Revision of the entire genus. In one instance (*personatum*) two species were certainly confused by me, an idea foreshadowed at Supplement, p. xlv. But I sink at least one form, as founded on conditions of no specific value, and others would probably go the same way had I sufficient connecting materials before me.

It appears to me that the species may be divided into two groups *according to the amount of prominence of the maxillary palpi of the ♂*. This is an excellent character, and amongst the large mass of materials there are scarcely any individuals left in doubt as to their position from this point of view.

The colour of the antennæ is sometimes of secondary specific value, but it is a character that should be used with caution, for it is often vague, and may occasionally be due to local influences.

Then, with regard to the anal parts. I have not succeeded in finding differences in the ♀, but it is by no means improbable that such exist, a point to be solved from a comparison of living or alcoholic specimens. In the ♂ I have arrived at the conclusion that, as a rule, no characters exist of any importance, excepting in the *penis-sheaths*, and for their precise examination it is usually necessary to remove the inferior appendage on one side. Even in the penis-sheaths it is evident, when a large mass of materials is examined, that much variation exists in what may reasonably be considered one and the same species, sometimes irrespective of locality, at others apparently to some extent depending upon local influence. This is of great importance, because these sheaths are of a very hard chitinous nature, and little subject to alteration or distortion in drying.

In giving a new arrangement of the species, according to my present views, *it is necessary to state that all materials formerly examined by me, and returned, should undergo a re-examination by those to whom they belong.*

- A. Maxillary palpi of the ♂ *very prominent*, pubescent, but often scarcely hairy, so that the integument is usually plainly visible.

<i>personatum</i>	}	<i>faciale</i>
<i>turbatum</i>		<i>siculum</i>
<i>timidum</i>		<i>galeatum (hamiferum)</i>
<i>pyrenaicum</i>		<i>indivisum</i>
<i>flavicornis</i>		
<i>Schneideri</i>		
<i>Selysi</i>		

- B. Maxillary palpi of the ♂ *slightly prominent*, very hairy, so that the integument is rarely visible.

<i>pedemontanum</i>	<i>Mac-Lachlanianum</i>
<i>carinthiacum</i>	<i>baticum</i> }
<i>clypeatum</i>	<i>vittatum</i> }

It is just possible that, hereafter, good connecting links may be found (of which there are indications already) between these two Groups.

Species bracketed together are closely allied, according to the penis-sheaths, and, in some cases, may not be distinct.

N.B.—All the figures of the penis-sheaths are drawn to nearly the same scale.

Sericostoma personatum, p. 226, and Supplement, p. xlvī (*personatum*, *Spencii*, *Latreillii*, *assimilis*, and *hyalina*, of English authors; *personatum*, *McLach.*, *partim, olim*; *analis*, Steph., ♀, *var*; *chrysocephala*, Zett.?).

This is the only species that occurs in Britain; the northern examples are darker than the southern. Possibly it is the only species in Scandinavia and Finland. Of its precise southern limit I am uncertain, but it seems to me that I have never seen it further south than the Vosges (Géradmer, &c.), the other individuals formerly confused by me with it being forms of *pedemontanum*.

It is extraordinarily variable in the form of the penis-sheaths as will be seen from the series figured, and I cannot decide that this is to any considerable extent dependent upon locality. As a rule, the upper branch is shorter than the lower, thicker, the upper apical edge oblique to the apex, and turned slightly downward (a notable exception is seen in fig. 8), sometimes with a distinct notch before the oblique apical edge (figs. 7, 8, and 9), rarely with the upper edge perfectly regular and gently curved (fig. 6).

PLATE II.—Fig. 1, head (in outline), from side. Fig 2, London; 3, Inverness-shire; 4, Devon; 5, Kent; 6, London; 7, Inverness-shire; 8, Glasgow; 9, Vosges; 10, Vosges.

In connection with *personatum* I give figures from isolated forms (single specimens) that I cannot satisfactorily place anywhere. They appear to have the palpi of Group A, but rather less prominently, and these parts are also more hairy.

Fig. 11, Ronquières, Belgium; 12, Nolay, France.

Sericostoma turbatum, p. 231.—I captured several very dark examples of this at the Cascade de Coë, Belgium, in July, 1881; the antennæ in these vary from clay-colour to nearly black.

PLATE II.—Figs. 1 and 2, Belgium (1, from a type).

Sericostoma timidum, Supplement, p. xlvii.—I can say nothing further about this insect, which appears very closely allied to *turbatum*, differing in its rather sharply annulate antennæ. I omitted to notice the condition of the palpi when the type was in my hands.

Here should, perhaps, be referred a small series of examples from the Vosges (Géradmer, &c., July, *McLachlan*), in which the antennæ are annulate (but indistinctly), and in which the penis-sheaths agree tolerably well with my figure of that of the type.

PLATE II.—Fig. 1, type, enlarged from former figure; 2, Vosges.

Sericostoma pyrenaicum, p. 230, and Supplement, p. xlviii.—I can make no further comments on this.

PLATE II.—Figs. 1 and 2, Pyrenees.

Sericostoma flavicorne, p. 230, and Supplement, p. xlviii.—I can add nothing further.

Sericostoma Schneideri, p. 230.—No further materials have come to hand; doubtfully distinct from *flavicorne*.

I now incline to refer here the example from "St. Aubin," alluded to at Supplement, p. xlvii, under *timidum*, and think my lamented friend Prof. de Rougement was, perhaps, mistaken as to the locality, and that it probably was captured by him during his tour in Southern Italy.

PLATE II.—Fig. 1, Ragusa; 2, "St. Aubin?"

Sericostoma Selysi, p. 231.—No further information. It evidently belongs to Group A, according to E. Pictet's figure of the head on pl. xi, fig. 3 (compare his figure of the head of *S. beticum*, pl. ix, fig. 3).

Sericostoma faciale, p. 233.—I have seen no further examples. Meyer-Dür (Mitth. schw. ent. Gesell., vi, p. 316) refers another example here.

One of the most distinct species, according to the extraordinary form of the penis-sheaths. It is quite possible that the condition of the palpi was owing to distortion, for I see indications of a similar condition in individuals of other species.

PLATE II.—Fig. 1, from type.

Sericostoma siculum, p. 232.—Of this Sicilian species I have no further information, and do not possess it. It should be one of the most distinct.

PLATE II.—Fig. 1, from type.

Sericostoma galeatum, p. 232 (*hamiferum*), and Supplement, p. xlviii. No further materials have come to hand.

PLATE II.—Fig. 1, from type of *hamiferum*.

Sericostoma indivisum, Supplement, p. xlviii.—I have nothing further to add. It should belong to Group A, from my words, "maxillary palpi of the ♂ very prominent."

Sericostoma pedemontanum, p. 229 (*personatum*, McLach., *olim*, *partim*; *personatum*, Meyer-Dür, Rostock, ?, &c; *collare*, Pict., Brauer, Meyer-Dür, *olim*, &c.; *memorable*, McLach.; *multiguttatum*, Pict., ♀, var.).

This commences Group B, and it may conveniently head that Group, because the maxillary palpi although less prominent than in Group A, are more so than in most of the other members of it, in some of which these palpi scarcely project beyond the face.

I have already stated that my former *personatum* was in part made up of materials that I now consider to belong here, and my fig. 12 (Pl. xxv) should be referred here.

Regarding all the materials (200—300 examples) before me as pertaining to one species, this is one of the most common insects in all the more hilly districts from Northern Central Europe to Central Italy, but I have not seen it (with certainty) from the Pyrenees and the Iberian Peninsula.

I adopt the name *pedemontanum*, there being no other available, excepting *multiguttatum*, Pict., which would be extremely misleading, being founded on a common condition of the ♀ only, a precisely parallel condition occurring in the ♀ of almost all the other species.

The materials before me have had long and careful study, and I think that when the figures of the penis-sheaths are examined, most students of these insects will agree that no course other than that here adopted was open to me.

In the typical example, from Turin, the upper branch of the sheaths is considerably longer than the lower, and quite simple (see fig. 2); other examples from Central Italy (Apennino Pistoiese, *Eaton*) mostly agree therewith. But there appears to me to exist every conceivable modification between this form and the other extreme (see figs. 14, 15).

Then again with respect to *S. memorabile* (see fig. 10), which, in the type, was apparently distinguishable by a projection on the lower edge of the upper branch before the apex, followed by an excision. Almost every possible gradation exists between the typical *memorable* and the condition in which the upper branch is absolutely simple. (A very singular condition exists in an example from the St. Gothard, taken with ordinary forms, in which there is an absolute tooth below the apex [see fig. 11]).

A long series of examples from the borders of North Italy and South Tirol (Val Camonica, Val Mazza, Tonale Pass, &c., *Eaton*) differ so much from the ordinary range of variation, and seem so far constant in the different individuals, that I doubt whether they ought not to be designated by at least a varietal term. In these the branches of the fork of the penis-sheaths are very short, simple, and the upper branch not infrequently *shorter* than the lower. In addition to this, the ventral triangle is ordinarily clear yellow, and its apex remarkably produced and acute. In former times I should have considered them distinct, but having in view the extreme variability now proved (I think) to exist in the "species" taken as a whole, I place them (at least provisionally) with *pedemontanum* (see figs. 20, 21, 22).

PLATE II.—Fig. 1, head (in outline), from side. Fig. 2, Turin (type); 3 and 4, Apennino Pistoiese; 5 and 6, Val Anzasca; 7, 8, 9, Bourg d'Oisans; 10, *memorable* (type); 11, St. Gothard; 12, Germany; 13, 14, Nolay, Côte d'Or; 15, Bergün, Grisons; 16, 17, 18, Vosges; 19, Val Levantina; 20, Val Agone; 21 and 22, South Tirol.

Sericostoma carinthiacum, Supplement, p. xlvii.—I have seen no further materials. Its palpi are about in the same condition as in *pedemontanum*. According to its *sharply annulate antennæ*, and the form of the penis-sheaths, it should be quite distinct.

PLATE II.—Fig. 1, from type.

Sericostoma clypeatum, p. 233.—This Corsican species is one of the most distinct. I have an additional example (Porto Vecchio, *Revelière*, 19th April).

PLATE II.—Fig. 1, Corsica.

Sericostoma Mac-Lachlanianum.

S. Mac-Lachlanianum, Costa, Rendiconti della R. Accad. Sci. di Napoli, 1884, fasc. ii.

Antennæ dark clay-coloured or fuscous, unannulated. Maxillary palpi of ♂ slightly prominent, clothed with fuscous or golden-brown hairs. A tuft of golden hairs on the vertex between the antennæ. Legs yellowish; the femora somewhat fuscous. Anterior-wings clothed with reddish-brown pubescence.

In the ♂ the upper branch of the penis-sheaths is long, nearly straight, or slightly curved downward at the tip (in one example the appendage seems slightly crenulate at the tip); lower branch shorter, directed downward almost at a right angle, triangular at the base, the apical portion slightly curved. Ventral triangle broad, triangular.

Island of Sardinia (Aritzo and Mt. Gennargentu, *A. Costa*, 2 ♂ in the Naples Museum; also one in my own collection, presented to me by Prof. Costa).

Very distinct in the form of the penis-sheaths from anything known to me. In some respects intermediate between *clypeatum* (of Corsica) and *bæticum* (of Spain and Portugal), and, on the whole, probably more allied to the latter.

A short description under the above name has been published by Prof. Costa. I do not quite understand his definition of the penis-sheaths by the words, "*lobo supero lato truncato-rotundato, infero parvo obtuso*;" my own description and drawings have been made from the types.

PLATE II.—Figs. 1 and 2, Sardinia.

Sericostoma bæticum, p. 234.—Probably distributed over all Portugal (on the slopes of Picota, and other localities near Monchique, Algarve, 1400—2000 ft., 19th to 21st May; near Cea, Beira Baixa, 1800 ft., 11th June; near Villa Real, 1730 ft., 22nd June, and near Salamonde, over 2000 ft., 30th June, Traz-os-Montes, *Eaton*; 19 ♂, 5 ♀).

In some examples in this long series the antennæ are distinctly annulate, irrespective of sex or locality; the yellow hairs on the vertex of the ♂ are often wanting. Some of the ♀ show a mixture of cinereous pubescence on the anterior-wings.

There is distinct variation in the form of the penis-sheaths, influenced largely by locality, but it is impossible to regard all the examples other than as pertaining to a single species. In examples from Algarve the form more closely resembles that seen in my figure on Pl. xxv, taken from a Spanish type (not now before me). In others, from the more northerly parts of the country, the general form of these sheaths is broader, and the lower tooth much broader and more decidedly triangular. The upper branch is frequently somewhat produced at the upper angle of the apex, which is occasionally minutely serrate.

PLATE II.—Fig. 1, Villa Real; 2, Cea; 3, Picota; 4, Salamonde.

No other species of true *Sericostoma* was found by Eaton in Portugal.

Sericostoma vittatum, p. 234.—One of the most distinct-looking species, in consequence of the golden-yellow vitta on the anterior-wings of the ♂. But the penis-sheaths, in the only example I possess, show so much affinity to those of *bæticum* that one is tempted to doubt whether a long series of examples may not show intermediate conditions of coloration, especially as both inhabit the same country.

PLATE II.—Fig. 1, Spain.

Schizopelex festiva, p. 235.—From Portugal (stream near Villa Real, Traz-os-Montes, 1630 ft., 24th and 25th June, *Eaton*) I have before me 15 ♂ and 4 ♀. These quite agree with the Spanish typical form *in structure*, but only a few show the markings on the anterior-wings with any amount of distinctness; in others these markings are faintly indicated; but in the majority these wings are clothed with *uniformly yellow* pubescence (with blackish-fuscous fringes), the darker markings being wholly obliterated. These unicolorous individuals agree almost entirely with *S. granjæ*, E. Pict., of which the type has now lost its abdomen, and were it not for the notable differences in the anal parts, &c. (especially in the form of the ventral processes) in E. Pictet's description and figures, I should consider *granjæ* only a colour-condition of *festiva*.

Æcismus monedula, p. 237, and Supplement, p. xlix.—Add Belgium (Bouillon, July, *McLachlan*, 1 ♂, 1 ♀).

Silo mediterraneus (*n. sp.*).

Very like *S. nigricornis*, but smaller on an average, and with the wings apparently rather narrower; the ♀ not paler than the ♂ in the examples before me. In the anterior-wings the 1st apical sector arises from about the middle of the discoidal cell; apical forks Nos. 2 and 3 nearly level at their base. In the posterior-wings apical fork No. 1 is *very long*, Nos. 2 and 3 *successively shorter*: in these wings in the ♂ the pouch or groove is *very deep*, nearly angular at the base, with not numerous, long, black, clavate hairs, arranged obliquely on the nervures.

In the ♂ the median dorsal lobe is inserted immediately under the margin of the last dorsal segment (as in *pallipes*, &c.); it is dingy testaceous, long, narrow, slightly flattened above, gently curved, if viewed laterally. Superior appendages short, obtuse, blackish. Intermediate appendages much longer than the dorsal lobe, narrow, scarcely dilated at the tips (which are hairy), applied closely to the long, thick, pale penis. Inferior appendages much as in *S. pallipes*, but the lower (or inner) branch is somewhat longer than the upper (or outer), and is distinctly truncate at its apex. Terminal ventral lobe broadly rounded. On the 6th ventral segment is a strong truncate central tooth, and 3 or 4 on either side of it, all of which are smaller, excepting those immediately on either side of the central, which are scarcely shorter than it: 7th segment without teeth.

In the ♂ the tubular-piece (or appendages?) forms two large, broadly lanceolate, flattened plates, somewhat divergent, sub-acute, and hairy. One strong tooth on the 6th ventral segment, with a minute toothlet on either side of it.

Length of body, 4—5 mm. Expanse, 12—16 mm. The smallest and largest examples seen by me are both ♀.

Italy (between Villa Margherita and San Marcello, Apennino Pistoiese, about 2000 ft., 27th July, *Eaton*, 5 ♂, 2 ♀; Naples, *Costa*, 1 ♂; Island of Sardinia, *Costa*, 1 ♂ in the Naples Museum).

The ♂ from Naples was alluded to at p. 251; it has the pubescence somewhat reddish-brown, probably the effect of age.

This species should precede *S. nigricornis*, of which it has much the appearance, and the long apical fork No. 1 in all the wings, but the proportions of the other forks in the posterior-wings are different, and the groove of these wings in the ♂ is very much deeper. In the ♂ the anal parts are more allied to those of *S. pallipes* (but with much shorter inferior appendages), and differ from those of *S. nigricornis* very strongly in the form and point of insertion of the median dorsal lobe. The anal parts of the ♀ are peculiar. Altogether it is very distinct, and the sight of more specimens has satisfactorily cleared up the uncertainty that existed when I had seen only the single ♂ from Naples.

PLATE III.—Fig. 1, neuration of part of wings of ♂: same of part of posterior-wing of ♀; 3, apex of abdomen of ♂, above; 4, same, from side; 5, inferior appendage and ventral lobe, beneath; 6, teeth of 6th ventral segment; 7, apex of abdomen of ♀, above.

N.B.—I have not yet seen the ♂ of the large pale form of *nigricornis* termed *dalmatina* by Kolenati.

Silo rufescens, p. 248.—From Corsica (Porto Vecchio, 19th April, *Revelière*) I have one ♂ of a peculiar *Silo* that so far agrees with Rambur's brief description of *rufescens* as to induce me to consider it specifically identical.

Body blackish: head and pronotum with reddish-brown hairs. Antennæ brown (almost fulvous in certain lights), the basal joint darker. Legs reddish-testaceous; coxæ blackish, excepting at the tips. Anterior-wings densely clothed with reddish-golden pubescence, but with a blackish space below the discoidal cell, and a short blackish line towards the base more inferiorly; fringes fuscous: neuration fuscous if the pubescence be removed; 1st apical sector arising from about the middle of the discoidal cell; apical fork No. 3 shorter than No. 2. Posterior-wings clothed with black pubescence, and with grey fringes: *groove scarcely indicated*, shallow, with only very few thickened hairs on the contained nervures: neuration fuscous, *apical fork No. 1 extraordinarily long and narrow*; No. 2 shorter, also narrow; No. 3 still shorter, broader; No. 5 long and narrow, especially narrow on the margin (there are some indications of a pouch or groove between the bases of the upper costulæ).

In the ♂ the median dorsal lobe is testaceous, short, sub-cylindrical, scarcely dilated toward the tip, scarcely curved if viewed laterally, inserted some little distance below the margin of the segment. Superior appendages short, broad-oval, blackish. Intermediate appendages very slender, considerably shorter than the long yellow penis to which they are closely applied. Inferior appendages with a broad, somewhat foliaceous upper (or outer) branch, and a rather longer band-shaped lower (or inner) branch. No visible terminal ventral lobe, *and no ventral teeth*.

♀ unknown.

Length of body, 5 mm. Expanse, 13 mm.

In several respects a peculiar species, not only by its colour, but also in structure. The practical obliteration of the groove of the posterior-wings would, at first sight, indicate affinity with *Lithax*, but the form is more that of *Silo*. The anal parts are as in *Silo*, but the apparent absence of ventral teeth shews affinity with *Selis*, from which its broader form, absence of groove in anterior-wings, neuration, &c., distinguish it. In the form and point of insertion of the median dorsal lobe there is some approach to *Silo nigricornis*.

I think it may fairly be considered Rambur's *rufescens*. The type of the latter was from the island of Sardinia, my example is from the extreme south-east of Corsica, only a short distance from Sardinia.

I have not seen the three species (of which *auratus* type is one) indicated by Hagen from Corsica in Ann. Soc. Ent. Fr., 1864.

PLATE III.—Fig. 1, neururation of wings of ♂; 2, apex of abdomen of ♂, above (in part); 3, same, from side.

Selis aurata, p. 252.—I have received a series of this species from Porto Vecchio, Corsica (*Revelière*).

It should be noticed that in the longitudinal groove of the anterior-wings of the ♂ are placed long, somewhat silky, pale yellowish hairs of a different nature to those of the ordinary pubescence. Also that the groove is indicated, but less strongly, in these wings in the ♀, but it contains no long hairs in that sex.

Revelière found the insect at the same shallow stream that produced the Corsican *Helicopsyche* (*vide post*), and among the mass of cases of the latter are two that in all probability pertain to *S. aurata*: they are formed much after the same fashion as are those of *Silo*, but are longer, and almost without the larger lateral stony fragments.

Micrasema morosum, p. 260, and Supplement, p. lv.—Upon re-examining the typical examples of this species (from Carinthia), I find that in the posterior-wings there is nearly always a very small *closed* discoidal cell (see Pl. iii, fig. 1). It is *not invariably* present, and is often exceedingly reduced; in the wing from which my figure on Pl. xxviii was drawn, it was absent, and this, no doubt, is the normal condition, notwithstanding its frequent occurrence.

PLATE III — Fig 1, neururation of apical portion of wings, shewing the closed discoidal cell.

From Portugal I have a series of examples that I refer here provisionally. They have the same form of wing, the same discoidal cell (apical fork No. 3 usually with a very short footstalk; no closed discoidal cell in the posterior-wings), and the anal parts so similar that it is difficult to find any distinctive characters. They cannot be referred to the closely allied *M. tristellum*, which has the anterior-wings more semicircular at the tips. All were collected by *Eaton*; the localities, &c., are as follows:—near Cea, Beira Baixa, 1700—1800 ft., 4th and 11th June; near São Romão, Beira Baixa, 2440 ft., 5th June; Cintra, near Lisbon, 1st June; Villa Real, Traz-os-Montes, about 1600 ft., 22nd and 24th June.

Micrasema mœstum, p. 261.—I refer here the examples from the Sierra de Gredos, Spain, mentioned at Supplement, p. lvii. Also a series of examples from Portugal.

Black. Antennæ uniformly fuscous. Clothing of palpi and of under-side of abdomen golden-grey. Legs silvery-grey; the femora often darker. Pubescence of anterior-wings more or less golden-grey; fringes grey: discoidal cell somewhat elongate, apical fork No. 1 impinging upon its upper apical edge; apical fork No. 3 extending quite up to, or even a little beyond, the anastomosis; nervule below the sector rather nearer the apex than that closing the discoidal cell.

In the ♂ the anal parts are very similar to those of *M. minimum*. The 9th dorsal segment forms a large greenish plate divided into two broad lobes (in alcoholic specimens). Inferior

appendages internally with two curved apical teeth on the outer edge, the inner edge bluntly produced. Penis and sheaths apparently as in *M. minimum*; in the sheaths only three minute teeth are visible if viewed laterally, but if viewed from beneath four or five are seen. No apparent ventral teeth (in either sex).

Expanse, ♂, $9\frac{1}{2}$ —10 mm.; ♀, 11— $12\frac{1}{2}$ mm.

Spain (as already mentioned). Portugal (stream south of Monchique, about 1200 ft., 19th May, and on the slope of Foia, over 2000 ft., Algarve, 21st May; near Villa Real, 1630 ft., 24th June, and near Ruivães, 1453 ft., 29th June, Traz-os-Montes: *Eaton*).

N.B.—The examples from Traz-os-Montes are decidedly darker than those from Algarve; those from near Monchique, 19th May, are decidedly larger than all the others.

Hagen's type of *mæstum* was a ♀ from Castile, said to expand to 15 mm., thus larger than any of the insects now before me; his indications for neuration so far agree as to induce me to consider these examples specifically identical.

Supposing my identification to be correct, *mæstum* is very closely allied to *minimum*. It is larger, with a longer discoidal cell, and slight differences in the position of the transverse nervules; the form of the apex of the inferior appendages of the ♂ is different. In connection with the possibility that *exiguum* is the ♀ of *minimum*, it may be remarked that the ♀ of the species above described certainly possesses apical fork No 5 in the posterior-wings.

PLATE III —Fig. 1, neuration of apical portion of wings of ♂; 2, discoidal cell, &c., of anterior-wing (more enlarged); 3, inferior appendage, internally, in front; 4, penis-sheath, beneath (3 and 4 from examples in alcohol).

Miscrasema sp.?.—From Switzerland (Val Bedretto, Ticino, 25th July, *McLachlan*) I possess 3 ♂ of a *Micrasema* agreeing with *tristellum* in neuration (especially in apical fork No. 3 in the anterior-wings not extending to the anastomosis); but in the anal parts there are evident penis-sheaths (which I do not see in *morosum* and *tristellum*) with three spiniform teeth at the apex (as in some other species). I hesitate to do more than call attention to these specimens at present.

A somewhat smaller ♂ from Belgium (Bouillon, 16th July, *McLachlan*; cf. *Compt. Rend. Soc. Ent. Belg.*, xxv, p. cxxix) probably pertains to the same species.

Micrasema setiferum, p. 263, and Supplement, p. lvi.—One ♀ taken by me at Retournemer, Vosges, July, appears to belong here according to the annulate antennæ, but it is otherwise doubtful.

Micrasema scissum (n. sp.).

Black: head, basal joint of antennæ, and apical portion of abdomen clothed with greyish-yellow hairs. Antennæ uniformly blackish-fuscous. Palpi fuscous; maxillary pair in the ♂ rather short, up-curved, the second and third joints nearly equal. Legs blackish-fuscous, the tarsi with a testaceous tinge. Abdomen blackish, with grey lateral lines. Wings somewhat elongate, pale grey, with short yellowish pubescence; pterostigmatic region darker and more opaque in the anterior-wings: neuration fuscous; in the anterior-wings the discoidal cell is

elongate and narrow; 1st apical fork very oblique at its base, 2nd apical fork with a long foot-stalk, 3rd apical fork sessile or nearly so; nervule closing the discoidal cell in an oblique line with that below it.

In the ♂ the 9th dorsal segment is narrow, with a small median triangle; below it is the "dorsal lobe," which is divided nearly to the base into two stout, slightly-curved, obtuse processes. Intermediate appendages (?) testaceous, broad laterally, the apex strongly up-curved and furnished with three bristles proceeding from denticulations of the edge, and on the upper edge near the base are about four similar bristles and denticulations on a dilated portion of the appendage. Penis broad, flat, obtuse, placed below the last-named appendages. Inferior appendages large, widely divergent, rather narrow at the base, but gradually dilated, so that the extremities are broad and very obtuse, convex externally, concave internally, fringed with long yellowish hairs; on the upper edge near the apex there is a deep excision in which is a strong curved spine, and one or two ridges or teeth (but the precise conformation is difficult to distinguish). No ventral tooth.

Expanse, about 15 mm.

The above description is taken from dry examples.

In examples of the ♂ in alcohol the abdomen above and beneath presents blackish chitinous plates, separated by broad pale segmental divisions.

In the only example of the ♀, in alcohol, the wings appear to be abbreviated, and shorter than the abdomen (which is much extended); they appear to be paler than in the ♂, with denser pubescence, nearly concealing the neuration. The 9th dorsal segment of the abdomen is produced into a small median triangle, and from it proceeds a small emarginate "dorsal lobe." There is no ventral tooth.

St. Lawrence (or Clerk's) Island, Behring Straits ("Vega" Expedition, beginning of August, 1879, *Nordenskiöld*, about 30 examples).

This may justly be included within the geographical region of the "European Fauna;" no doubt it occurs on the mainland of both Siberia and Alaska, and possibly it has an extended arctic range.

M. scissum may be readily distinguished from all described species of the genus by the peculiar anal appendages of the ♂. I know of no other species in which the "dorsal lobe" is thus divided; in other respects there is no generic inconsistency.

PLATE III.—Fig 1, neuration of wings of ♂; 2, extremity of abdomen of ♂, from side; 3, same (in part and in outline) above; 4, same (ditto), beneath.

Thremma sardoum.

Th. sardoum, Costa, Rendiconti della R. Accad. Sci. di Napoli, 1884, fasc. ii.

It was my intention to have left the single example upon which this name has been imposed without further remark at present, not being able to make any satisfactory description or drawings from it. The anterior-wings appear to be blackish, but with several large spots formed by golden pubescence. The anal parts (the insect is a ♂, not a ♀ as supposed by Costa) seemed to differ materially from those of *Th. anomalum* and *gallicum*.

Island of Sardinia (Tempio, *A. Cabella*); in the Naples Museum.

HELICOPSYCHE, p. 266, and Supplement, p. lviii.

Additional and valuable information concerning these singular and inter-

esting insects has been obtained. I am now sure that the European cases enumerated at pp. 267—268 do not all belong to one species, and believe that I am acquainted with *three* European species, and that the number of those existing in Europe is probably much greater. I am also convinced that the cases reported from the cascade known as the "Pissevache," in the Valais (*not in Savoy*), do not belong to *Helicopsyche*. I saw the identical cases noticed by Bremi (*cf.* Hag. Stett. Zeit., 1864, p. 131) in the Zürich Museum, and, in my opinion, they are those of *Psyche* (*Cochlophanes*) *helix*, and therefore Lepidopterous.*

I have little or nothing to add to the generic details published in the last Supplement. The existence, or otherwise, of a minute basal joint in the maxillary palpi of the ♂ is still uncertain with me. Dr. Fritz Müller denies its existence in the Brazilian species bred by him. Nevertheless, I incline to the belief that it does exist, and in certain examples from Portugal, in alcohol, I think (without being certain on the point) there are indications of it, concealed behind a fleshy tubercle (rudimentary mandible?) on either side of the labrum.

How many (if any) of the exotic species are absolutely congeneric with the European I cannot yet say. Some of them appear to present differences sufficient for generic separation.

Helicopsyche sperata, p. 269, and Supplement, p. lxi.—The case originally described as a shell by Tassinari, under the name *Valvata agglutinans* (*cf.* p. 267), I think certainly belongs here, but, for reasons already stated, I do not adopt the specific name.

Add, as locality:—Apennino Pistoiese, Central Italy (near Villa Margherita, San Marcello, about 2200 ft., and near Ponte del Lima in the Valle Sestajone, about 4000 ft., 26th and 27th July and 4th August, *Eaton*, 3 ♂, 1 ♀).

***Helicopsyche lusitanica* (n. sp.).**

Case? :—*H. sericea*, Hag., Stett. Zeit., 1864, 130; *cf.* McLach., Rev. and Synop., Supplement, lxi.

Of this I have seen only specimens in alcohol (with the exception of a much damaged example taken apparently from a spider's web), in all of which the pubescence is removed; all these are ♂. These insects agree with *H. sperata* in size and form of wings, but with apparently paler (testaceous) legs. In the absence of pubescence it is impossible to say anything as to the patch of thickened hairs on the anterior-wings, which seems to furnish a specific character of some importance.

In the ♂ the anal structure is formed quite after the plan seen in *H. sperata*, but there are apparently good specific differences. The superior appendages appear to be longer. Inferior appendages apparently much more dilated after the base, the basal process (or branch) shorter and less stout; seen from above or beneath, the inner edge bears coarse teeth, from each of which springs a strong bristle, and the apex has two teeth. Penis-sheaths somewhat dilated and curved upward at the tips. Viewed ventrally, there is seen a short, straight, cylindrical process within the bases of the inferior appendages. Intermediate appendages long, not serrated externally.

* The late Prof. de Rougemont published an account of a fruitless search for *Helicopsyche* in the Valais, &c., in the Bull. Soc. Sci. Nat. de Neuchâtel, xi, pp. 29—38 1879.

Portugal (on the slopes of Picota, near Monchique, Algarve, 20th May, Eaton, 6 ♂).

I would much have liked to compare alcoholic specimens of *H. sperata* with this insect, more especially as my figures of the inferior appendages given for that species may not represent their true form; but there appear to be other structural differences sufficient for specific separation.

PLATE III.—Fig. 1, head of ♂, above; 2, apex of abdomen of ♂, above; 3, same, from side; 4, same, beneath (all these outline figures are from examples in alcohol).

Also from Portugal (neighbourhood of Cea, Beira Baixa, 5th and 11th June, Eaton) I have 2 ♀ (dry) of *Helicopsyche* that I hesitate to unite with *H. lusitanica*, on account of their much smaller size (the ♀ is usually the larger in this genus); they are much rubbed, but appear to have been much paler originally than *H. sperata*. I do not detect any ventral tooth in these specimens.

N.B.—In connection with the occurrence of this genus in Portugal, the cases in the British Museum from near Oporto (*cf.* p. 268) should not be forgotten.

Helicopsyche Revelieri (n. sp.).

Case:—*H. Shuttleworthii* (for bibliography, *cf.* p. 267).

Head of ♂, above, with two large tufts of sub-erect golden-yellow (mixed with blackish behind) hairs, placed on the posterior portion of each pyriform wart; a double tuft of pale yellow silky hairs on the face curved up between the antennæ. Palpi clothed with golden-yellow. Antennæ fuscous, rather indistinctly annulated with testaceous; basal joint with yellow hairs (in the ♂ the clothing of the head is sparse, not arranged in tufts, and darker). Legs silky yellowish; tibiæ and tarsi externally (especially of the posterior legs) fuscous. Thorax and abdomen blackish; anal parts yellow. Anterior-wings narrower than in *H. sperata* (especially narrower in the ♂), very densely clothed with golden-brown adpressed pubescence, in which a slight oblique line in the apical portion in the ♂, formed of more thickened blackish hairs, is often visible; fringes long, fuscous: neuration apparently not differing in arrangement from that of *H. sperata*. Posterior-wings blackish-brown, with concolorous fringes.

In the ♂ (dried) the anal parts are arranged after the same plan as in the other European species. The most noticeable difference from the preceding species is that the inferior appendages have no basal process (or branch), but the ventral angle in these appendages is somewhat produced. Superior appendages very small (only just visible in dry examples). Minute details of the anal parts should be made from examples in alcohol.

In the ♀ (dried) the anal parts are formed generally after the plan seen in *H. sperata*.

Expanse, 8–9 mm.; the ♀ usually the larger.

Corsica (Porto Vecchio, *Revelière*; I have received more than 50 examples of both sexes).

PLATE III —Fig. 1, neuration of anterior (and portion of posterior) wing of ♂; 2, head of ♂, above (in outline); 3, apex of abdomen of ♂, from side (ditto); 4, inferior appendages, &c., beneath (ditto). All from dried specimens.

My generous correspondent, M. Revelière, furnished me with most abundant materials for this species, both of imago and also of cases, a portion of which were in alcohol. Inability on my part to attend to the alcoholic specimens at once, resulted in the spirit evaporating, so that I cannot now give such minute structural details and figures as otherwise might have been obtained.

The small size of the creature, the pale yellow clothing of the head, the golden-brown pubescence of the anterior wings, the anal structure of the ♂, &c., all prove this to be abundantly distinct from *H. sperata*.

The same reasons that have induced me to set aside the specific name *agglutinans* as applied to the case of *H. sperata*, cause me to set aside that of *Shuttleworthii* as applied to the case of *Revelieri*, and, in adopting this latter term, I carry out the wishes of my late friend de Rougemont, who intended to thus designate the insect in a paper he had in preparation before his long illness and premature death.

M. Revelière had furnished Prof. de Rougemont with extremely detailed information concerning the insect, which he bred in great quantity. This information is now not available. But he also, in his letters, imparted a portion of it to me, and I think some extracts will be useful. He found the larvæ in very great abundance in a shallow stream near Porto Vecchio, and, according to his observations, the imago probably continues to appear nearly all the year round in that southern locality, but it seems to require a certain degree of warmth, and its emergence from the case is always effected in the day-time. The larvæ and pupæ can exist with only a very slight amount of moisture; as a proof of this, a number of larvæ placed by him in a vessel with sand and water were neglected during a period of three weeks, owing to illness; at the end of that time the water had evaporated, leaving the sand uncovered, but moist, and the larvæ were still alive.

I have 200—300 cases before me from Porto Vecchio. They vary much in size— $2\frac{1}{2}$ to $4\frac{1}{2}$ mm. in diameter; each case forms fully two and a half whorls. The building material is fine sand-grains, and in the two upper whorls, and frequently in part of the lower whorl, the colour is blackish, and the individual sand-grains appear to be cemented together, or covered, by some matter that renders difficult the discrimination of single grains. But the mouth-end of the lower whorl is invariably composed of *pale* sand-grains, even in the smallest (and presumably youngest) cases, proving apparently that the black colour of the older portion of each case is due to some sedimentary deposit.

In addition to the above-mentioned cases, M. Revelière forwarded about 40 found by him in 1860 under stones in torrents at Monte Renoso, above Bastelica. These vary in size as in those from Porto Vecchio, but the sand-grains of which they are composed remain pale in all portions of each case, due probably to the condition of the water the larvæ inhabited.

For my part I consider it most probable that the cases from Porto Vecchio and Monte Renoso belong to the same insect. But the subject assumes a certain amount of significance, because M. Revelière suggested (in one of his letters) that as the original cases found by Blauner in Corsica were from the mountains, those from Monte Renoso are probably identical with *Shuttleworthii*, supposing the insects frequenting the two localities to be distinct.

The case from the Lago di Como, mentioned in connection with *H. Shuttleworthii*, more probably is to be referred to *H. agglutinans*, and therefore to *H. sperata*.

Lepidostoma hirtum, p. 274, and Supplement, p. lxiii.—The description of the structure of the inferior appendages of the ♂ at p. 275 is not sufficiently precise; add the following: inserted in the concave inner-side of each appendage, a little below the apex, is a small obtuse process or supplementary joint, visible both above and beneath; at the inner edge of the base (connected therewith?) of each appendage, viewed ventrally, is a straight slender process.

PLATE II.—Fig. 1, inferior appendage of ♂, from beneath.

Lepidostoma fimbriatum, p. 276.—A ♂ from Portugal (slopes of Foia, near Monchique, Algarve, about 2800 ft., 21st May, *Eaton*) agrees with the description of the type (which is not now before me); it expands to 15½ mm. From it I make the following additional notes:—

The fringe of long clavate hairs turned downward, at the base of the costa of anterior-wings, is less extended than in *L. hirtum*, and yellowish instead of black; the few “scales” on these wings are nearly confined to the nervures. On the posterior-wings the “scales” are more numerous, and sparsely scattered over the membrane as well as on the nervures.

The anal parts are quite analogous to those of *L. hirtum*; probably the spiniform intermediate appendages are more slender and sinuous; all the hairs are yellow.

A ♀ from Portugal (streamlet near Villa Real, Traz-os-Montes, 1280 ft., 25th June, *Eaton*) probably belongs here: it expands to 18 mm., and does not apparently differ in structure or colour from the same sex of *L. hirtum*.

I think *L. fimbriatum* may be regarded as specifically distinct, but the only very tangible differences from *hirtum*, in the ♂, are the paler colour, and the very sparse clothing of “scales” on the anterior-wings.

PLATE II.—Fig. 1, intermediate appendages of ♂, above.

Dinarthrum pugnax, p. 279.—Additional materials from Ala Tau (3 ♂, 2 ♀, received from Staudinger), in better condition than the original types, enable me to give amended descriptions and figures of the anal parts.

In the ♂ the 9th dorsal segment forms a broad plate, the apical edge of which is almost rounded, whereas the sides slope outward, so that it forms a kind of broad triangle with very obtuse apex. From beneath either side of this plate proceeds a large triangular piece, slightly ciliated on the margins (these may be considered superior appendages). From beneath the apex of the plate, viewed from above, proceeds what looks like a double plate, the divisions of which are (usually) separated by a notch, and the sides of which are directed nearly vertically downward if viewed from the side; but seen from beneath it is tolerably evident that this apparently double plate represents the intermediate appendages, forming two broad, ciliated, slightly divergent apical pieces, proceeding from a broad concave basal part in the cavity of the apex. Inferior appendages very long, directed strongly upward, lanceolate, and acute, with a strong fringe of hairs on the lower edge; within the apex of each is attached a kind of sub-apical second joint, which is flattened and semi-transparent, and broadly truncate at its apex (this is the homologue of the process in *Lepidostoma* noticed above). The penis and sheaths can be seen from beneath; the penis is short and very slender, notched at the apex, turned somewhat to the right; it is accompanied by a pair of longer sheaths, also turned to the right; whereof the left-hand one is slender and spiniform, and the right-hand one is broader, flattened, somewhat suddenly acuminate, and very acute at the apex.

In the ♀ the 9th dorsal segment forms a plate with very obtuse apical edge, from beneath which projects a bifid (if viewed from above) plate, very concave beneath. Ventrally there appears to be a broad vulvar-scale, slightly acuminate at its apex.

PLATE II.—Fig. 1, apex of abdomen of ♂, above; 2, same, from side; 3, penis and sheaths, beneath, showing the asymmetry (more enlarged); 4, apex of abdomen of ♀, above.

Fam. LEPTOCERIDÆ.

The transference of *Beræa* and allies to this Family (cf. Supplement, p. lviii), renders invalid the indication of "Sections" by numerals. I therefore propose the scheme noticed below, which is the more advisable because there may probably exist exotic species of the Family that will not fall within the limits of any of the "European" Sections; and the latter remark applies equally to other Families.

Section of BERÆA	(= Section iv of <i>Rhyacophilidæ</i> , p. 490).
" " MOLANNA	(= " i " <i>Leptoceridæ</i> , p. 283).
" " ODONTOCERUM	(= " ii " " p. 290).
" " LEPTOCERUS	(= " iii " " p. 293).
" " CALAMOCERAS	(= " iv " " p. 345).

Beræa dira, p. 495.—Add: Portugal (on the slopes of Foia, near Monchique, Algarve, 21st May, *Eaton*, 1 ♂).

I give here a better figure of the neuration of the ♂. In the anterior-wings there is a long slightly curved groove or line on which the hairs are thicker than those of the ordinary pubescence, and which appears conspicuously whitish when denuded.

The three examples now known to me (presuming all belong to the same species) are from widely-separated districts: South Portugal,* Fiume, and Turkestan.

PLATE IV.—Fig. 1, neuration of wings of ♂.

N.B.—From Portugal (near Cea, Beira Baixa, 11th June, *Eaton*) I have one ♀ of a *Beræa* that remains doubtful, but I do not think it can represent that sex of *B. dira*. Probably the ♀ from Monchique, alluded to (under *B. pullata*) in the Rev. and Synops., p. 494, requires further examination.

Beræa maurus, p. 496.—It appears to me certain that the description and figures of the anal parts given for the ♀ at p. 497 (Pl. lii, figs. 8—10), from examples in alcohol, were not taken from a ♀ of *B. maurus*, but, probably, from *B. articularis*. I subjoin a more correct description:—

In the ♀ the appendages are narrower than in *B. pullata*, but much broader than in *B. articularis*, distant, slightly dilated externally at the base; they are possibly cylindrical (not hollow beneath?), and are, perhaps, not connected by a membrane, but immediately below them there is a whitish membrane occupying the middle of the egg-pouch. In the middle of the lower part of the egg-pouch is seated a large, obtusely triangular, somewhat testaceous, shining plate, projecting slightly beyond the edge of the pouch (in dried specimens), and deeply concave above. Egg-pouch regular on its outer edge, very densely fringed, and clothed beneath with long hairs. Tooth on penultimate ventral segment strong and sharp.

* At p. 496, when alluding to the "plate" on "the ante-penultimate (penultimate?) ventral segment," I said that the outer edge is "distinctly serrate." In the example from Foia the words "deeply pectinate" would be nearer the truth. I cannot re-examine the specimens from other localities. In other respects my description and figures of the anal parts are perhaps not exact.

The above description does not agree in all respects with that given by Hagen in the *Stett. Zeit.*, 1868, p. 57, but accords more nearly therewith than did my former one, and is, I believe, substantially correct, but I have no alcoholic specimens before me at present.

My former description of the head, neuration, &c., pertains to *B. maurus*: the head of the ♀ is nearly similar in form to that of the ♂. As before (*cf.* p. 496, foot-note), I fail to detect the small terminal fork of the sub-costa in the anterior-wings of the ♀ mentioned by Hagen.

B. maurus is apparently spread over all Northern and Central Europe, and extends to North Italy; but I have not seen it with certainty from the Spanish side of the Pyrenees.

PLATE IV.—Fig. 1, apex of abdomen of ♀, above; 2, same, from side; 3, same, beneath (from a dry example).

Beræa articularis, p. 497.—I have taken this at the foot of the Salève, near Geneva (Pietet's locality), in North Italy (Val Anzasca and Val Cannobbio), and in the Vosges (Remiremont), but it appears less frequent than the following species.

Beræa vicina, p. 499.—Add: Switzerland (Vispthal, Valais, 11th July, common; Airolo, St. Gothard, and Val Bedretto, Ticino, in July; *McLachlan*); North Italy (Val Furva, 27th July, *Eaton*, common).

I give figures of the head of ♂ and ♀ of this species, in order especially to show the large conical projection between the antennæ in the ♂, which (undened) carries a tuft of hairs on either side.

The ♀ would appear to be much less frequently caught than the ♂. I possess 3 or 4 examples, but refrain from giving details or figures of the anal parts, not being able, from my present materials, to make these comparative with those of *B. articularis*, owing to the shrinking that always happens in dry examples. I think the superior appendages are shorter than in *articularis*, but equally (or more) slender.

I am sure that no tooth exists on the basal joint of the antennæ of the ♂ in *articularis* and *vicina*.

In the neuration of the posterior-wings it appears to me that the upper branch of the fork of the sector is as frequently simple as furcate, both in *articularis* and *vicina*, and in either sex. Instability in the apical forks is a feature in the *Beræa* group.

PLATE IV.—Fig. 1, head of ♂, above; 2, same of ♀.

Molanna palpata, p. 287, and Supplement, p. lxxiii.—Add: Scotland (Strathglass, Fortingal, Tongue, and Kinardochie, *J. J. King*; Dollar, *A. Beaumont*; Island of Harris, *C. W. Dale*; usually very abundant).

Leptocerus alboguttatus, p. 300.—Add: Belgium (Liège, 8th July, *McLachlan*, 1 ♂); Portugal (Cintra, near Lisbon, 31st May, *Eaton*, 5 ♂).

Leptocerus inæqualis (*n. sp.*).

Of the group of *L. cinereus*, which species it should probably precede.

Black; head and thorax clothed with hoary hairs. Antennæ black, very distinctly annulated with white in the basal half. Palpi fuscous. Legs dark fuscous, somewhat silvery, an appearance caused by the pubescence; tarsi annulated with whitish-yellow. Anterior-wings clothed with brownish-cinereous pubescence, with indications (probably much more pronounced in life) of paler markings, as is often the case in *cinereus*; fringes blackish. Posterior-wings blackish-fuliginous, with black neuration and fringes.

In the ♂ the superior appendages are long, slender, and finger-shaped, divergent, fuscous, clothed with yellowish hairs. Upper penis-cover testaceous, very long, slender, gradually dilated to the base; the two branches separated to the base, *strikingly unequal in lengths, the right-hand one being much shorter than the left-hand*; viewed laterally each is *very strongly and suddenly up-curved at the apex*, almost mucronate. Inferior appendages nearly straight, *somewhat finger-shaped*, scarcely acute, dilated towards the base, where, inwardly, there is a strong angular dilatation furnished with long hairs; ventrally they are inserted somewhat distantly, and each is dilated at the base, and there is a much-curved, slender, inner testaceous branch (usually visible laterally). Penis short, stout, and obtuse.

In the ♀ the appendages are broad, flattened, somewhat angulate, blackish. Lateral valves small and testaceous. The oblique apex of the abdomen, viewed ventrally, very highly polished.

Length of body, ♂, 7–8½ mm., ♀, 7 mm. Expanse, ♂, 21–24 mm., ♀, 21 mm.

Portugal (stream south-west of Almodovar, about 400 ft., Alemtejo, 8th May, and near São Barnabe, Algarve, 12th May, 9 ♂, 1 ♀, *Eaton*).

Distinctly of the group of *L. cinereus*, but with very decided anal differences, the *asymmetric branches of the upper penis-cover* being especially peculiar and characteristic, and absolutely constant in the nine males before me. The reason for asymmetry in the anal parts (of which many instances are now known to me in *Trichoptera*) is not easy to suggest, but possibly a study of the living insects *in copulâ* might furnish some clue.

PLATE IV.—Fig. 1, apex of abdomen of ♂, from side; 2, superior appendages and upper penis-cover, above; 3, inferior appendage, beneath; 4, upper penis-cover, from side (more enlarged); 5, apex of abdomen of ♀, from side.

Leptocerus cinereus, p. 304, and Supplement, p. lxiv.—Add: Portugal (Porcallhota, between Cintra and Lisbon, 1st June, *Eaton*, 1 ♂. This example is not in good condition, but appears to agree with *L. cinereus* in its anal structure; in colour it most resembles *var. 2*, p. 305. In Southern Portugal *cinereus* appears to be replaced by several other species).

Leptocerus cuneorum (*n. sp.*).

Allied to *L. cinereus*, but in size and colour much resembling *aterrimus*, *var. tineoides*, the anterior-wings being clothed with reddish-brown pubescence, without markings, the posterior nearly black: in the anterior the two upper nervules of the anastomosis are continuous (or nearly so), the third placed more inwardly. Antennæ dark brown, but with a silvery appearance above, *without distinct annulations*. Tarsi faintly annulate.

In the ♂ the superior appendages are very slender, *much erected*, divergent, fuscous, with reddish-brown hairs. Upper penis-cover testaceous, long; viewed laterally it is slender, slightly dilated towards the base, *arcuate, the tips acute and strongly curved downward* between the inferior appendages; viewed from above, the two branches appear to be united for fully the basal half, and afterwards divided but contiguous and parallel; there are a few hairs on the upper

edge. Inferior appendages fuscous; viewed laterally they are formed as in *L. cinereus*, but are much shorter and stouter, the apex sub-obtuse, the internal basal dilatation very large and furnished with long hairs: ventrally they are slightly separated at the base, and each has an inner shorter, contiguous, testaceous branch. Penis very short, stout.

In the ♀ the appendages appear to be large and broad, but they are scarcely definable in the dry insect. Lateral valves small, prominent, rounded on the margin, yellow.

Length of body, ♂, 6—6½ mm., ♀, 6½ mm. Expanse, ♂, 17½—18½ mm., ♀, 16½—17½ mm.

Portugal (near Almodovar, Alemtejo, 6th and 8th May, and near São Marcos da Serra, Alferce, Algarve, 22nd May, 7 ♂, 2 ♀, *Eaton*).

Although this so deceptively resembles *L. aterrimus* var. *tineoides* in size and colour, it clearly belongs to the group of *cinereus*, and is closely allied thereto: the points emphasized in the above description readily separate it therefrom; the much erected superior appendages of the ♂ recall to mind those of many species of *Trianodes*.

PLATE IV.—Fig 1, apex of abdomen of ♂, from side; 2, inferior appendage, ventrally; 3, upper penis-cover, from side (more enlarged); 4, apex of abdomen of ♀, from side.

Leptocerus Braueri.

Myst. Braueri, Ed. Pict., Névrop. d'Espagne, 96, pl. xiii, figs. 7—13 (1865).

L. cinereus, var. 4 (*Braueri*), McLach., Rev. and Synop., 304.

Closely allied to *L. cinereus*. Blackish, clothed with brownish or cinereous hairs. Antennæ dark brown or blackish, the basal portion annulated with whitish-yellow (near the base the lower third or quarter of each joint is of this colour). Legs yellowish; femora fuscous, with cinereous pubescence: tarsi with fuscous or fuscous annulations. Anterior-wings clothed with yellowish or brownish-cinereous pubescence, mixed with blackish (without any distinct markings in the dry insect, save indications of a pale arcular spot); anastomosis as in *L. cinereus*. Posterior-wings fuliginous, with blackish neuration.

In the ♂ the anal parts are extremely similar to those of *cinereus*, and differ chiefly in the form of the tips of the upper penis-cover, which, if viewed laterally, are slightly curved downward between the inferior appendages, acute, but rather suddenly broadened beneath immediately before the apex (compare figures); the superior appendages appear to be somewhat shorter, broader, and more sinuous.

♀ unknown.

Length of body, ♂, 6—6½ mm. Expanse, ♂, 17—19 mm.

Spain (Malaga, *E. Pictet*); Portugal (stream near Caldas de Monchique, Algarve, 18th May, *Eaton*, 2 ♂).

Having to examine the Portuguese examples, I was induced to make a fresh study of *E. Pictet's* types of *Braueri*, and find them specifically identical with those from Portugal, and distinct from *cinereus* (but yet representative), especially in consequence of the tips of the branches of the upper penis-cover being downturned, whereas they are always upturned in *cinereus*.

PLATE IV.—Fig. 1, apex of abdomen of ♂, from side; 2, superior appendages and upper penis-cover, above (from one of *E. Pictet's* types).

Leptocerus interjectus.

L. interjectus, McLach., Comptes-Rendus Soc. Ent. Belg., xxv, p. cxxx (1881).

Very closely allied to *L. albifrons*, and of the same size, the vertex, front, and basal joint of antennæ clothed with snow-white hairs as in that species, and the white markings on the anterior-

wings are similar. Legs more or less whitish, somewhat silvery, the tarsi very conspicuously annulated with black and white. Abdomen vivid green in life (which colour scarcely changes in the dry insect, especially in the ♀). Ground colour of anterior-wings intense black in life (but soon fading); fringes black. Posterior-wings deep smoky-black, with black fringes.

Differences from *L. albifrons* in the anal parts are not very evident. The two large rounded superior lobes at the end of the abdomen in the ♂ are perhaps smaller and more separated. The inferior appendages possibly stouter, especially the second joint.

Belgium (on the Semois at Bouillon in July, in countless myriads, flying a short distance above the surface of the water toward sunset; *McLachlan* and *De Selys-Longchamps*). I believe it has also been taken in the North of France (*Poujade*).

That this is distinct from *albifrons* there can be no doubt; the latter occurred sparingly with it at Bouillon, but its manner of flight was quite different, being high and somewhat wild in comparison. The intense blackness of the wings (in life) contrasting with the snow-white vertex and markings was very conspicuous, and no examples of *albifrons* at all approach it in this. The white vertex at once distinguishes it from *bilineatus* (which flies in the bright sunshine), and the form of the upper penis-cover from *commutatus*. The sharp black and white annulations of the tarsi are also very conspicuous.

In my original description (*l. c.*) I called attention to an apparent difference in the form of the upper penis-cover, but further examination of *albifrons* does not confirm this. There may be slight differences, but it is necessary to compare both species in alcohol in order to decide on their value. Thus my figure will *perhaps* tend more to show the resemblance of the parts to those of *albifrons* than to indicate striking differences.

PLATE IV.—Fig. 1, apex of abdomen of ♂, above; 2, same from side.

Leptocerus commutatus, p. 308, and Supplement, p. lxiv.—Add: Belgium (on the Salm, near Coö, 18th July, *McLachlan*), and Livonia (*Max von zur Mühlen*).

Mr. J. J. King has called my attention to an excellent *prima facie* character whereby to separate the ♀ of *L. commutatus* from the same sex of its near allies (especially *albifrons*). Towards the apex of the antennæ there is a long space (6 or 7 joints) *totally silvery-white* without the slightest trace of darker annulations.

Leptocerus aureus, p. 309.—Add as a locality in Switzerland, on the Rhine near Bâle, 25th August (*McLachlan*, 1 ♂); add also Livonia (*Max von zur Mühlen*, 1 ♂; this example has the pubescence of the anterior-wings more ferruginous than golden).

Mystacides azurea, p. 315.—Portugal (Cintra, near Lisbon, 27th and 30th April, 1 ♂, 2 ♀; Villa Nova de Gaia, near Oporto, 20th June, 1 ♂, 2 ♀; *Eaton*).

Of the above-mentioned examples, 1 ♂ and 1 ♀ from Cintra are very large (expanse, 18—18½ mm., thus as large as *M. nigra*); those from Oporto are of

the ordinary size, but the single ♂ is remarkable for the unequal blades of the upper penis-cover, the right-hand one being quite one-half longer than the left; I observe a tendency to this asymmetry in examples from other localities.

Mystacides longicornis, p. 316.—Add: N. W. Siberia (River Kouda, *Sundman*, several examples).

Mystacides monochroa, Supplement, p. lxiv.—I have now seen 2 ♂ from Zürich (*Meyer-Dür*). They agree with the females in colour, and the anal parts do not apparently differ from those of *M. longicornis*, but I am forced to consider the specific right proved.

Mystacides leucoptera (*n. sp.*).

Body (in the dry insect) pale whitish-yellow, with concolorous pubescence; eyes deep claret-colour. Antennæ white, very narrowly brownish at the sutures (unannulate). Palpi clothed with white hairs. Legs white. Anterior-wings *white* (with the slightest possible greyish tinge); a slight dusky pterostigmatic mark; pubescence slight, *white*; fringes *white*: neuration fuscescens. Posterior-wings *white*, with white fringes and fuscescens neuration.

Anal parts of ♂ and ♀ not apparently differing from those of *M. longicornis*, unless it be that the blades of the upper penis-cover are possibly shorter than is usual in that species. All the parts very pale (yellowish-white or whitish) in both sexes.

Length of body, 4—4 $\frac{3}{4}$ mm. Expanse, 14 $\frac{1}{2}$ —15 mm.

South Tirol (Riva, Lago di Garda, at light, 1st August, *Eaton*, 2 ♂, 2 ♀, but many examples seen).

This adds another to the forms which, while agreeing almost precisely with *M. longicornis* in structure, differ widely in colour. Considering its very small size, almost totally *white* coloration, and the fact that all the individuals are similar, it is impossible that *M. leucoptera* can be only a variety of *longicornis*. Neither can it be the same species as *M. monochroa*, the latter being of the size usual in *longicornis*, with the anterior-wings uniformly clothed with *golden* pubescence; it agrees, however, therewith, in the antennæ being not truly annulate, but only narrowly dark at the sutures. It is a most lovely and delicate little insect.

Homilia leucophæa, p. 318, and Supplement, p. lxxv.—Add: Holland (Limbourg, *Maurissen*, in Albarda's collection); Belgium (Liège and Dinant, *McLachlan*, cf. Compt. Rend. Soc. Ent. Belg., xxv, p. cxxxi).

Triænodes ochreella, p. 322.—Add: Portugal (the Mondego at Coimbra, 2nd June, and at Ponte de Morcellos, 12th June, Beira Baixa; near Villa Real, 24th June, Traz-os-Montes; *Eaton*, 6 ♂, 5 ♀).

I subjoin a complete description from these examples:—

Body yellowish; clothing yellowish-ochreous. Antennæ pale yellowish, narrowly annulated with blackish at the sutures to beyond the middle, the apical portion almost whitish; basal joint much longer than the head, yellowish, clothed with ochreous hairs. Legs pale whitish-yellow. Anterior-wings narrow, rather densely clothed with bright yellowish-ochreous pubescence; a black point on the inner margin rather before the middle, another (larger) just above

the arculus, a few specks (often wanting) on the apical portion of the disc, and at the base of the apical fringes (these points all caused by black hairs in the otherwise pale pubescence); apical fringes long, brownish, becoming especially long and dark at the anal angle. Posterior-wings smoky-grey, with darker pubescence, and fuscous iridescent fringes.

In the ♂ the superior appendages are large and broad, not erected; laterally they are seen to be almost bilobate, the upper portion much longer than the lower, yellow (as are all the anal parts), clothed with very long concolorous hairs. Between these appendages is a long, slender, straight, dorsal process, slightly and gradually dilated to the apex. Below this is a straight, stout, semi-transparent process with rounded deflexed sides, and sharply truncate apex (upper penis-cover?). Then follows the very long and thick penis (if it be such), which is strongly curved down between the inferior appendages; on its upper edge are placed two parallel lanceolate blades (intermediate appendages?), and on each side there is apparently a very slender sheath, slightly hairy at the tip. Inferior appendages placed on the very large, broad, sub-quadrate, 9th ventral segment: viewed laterally, they are curved upward, becoming slender at the tips, with two spine-bearing teeth on the upper edge, and the apex furnished with conspicuous dark spines; viewed from above, the apices are seen to be inturned, and provided with very numerous strong spines; ventrally they arise contiguously, are broad at the base, afterwards becoming more slender, the tips obtuse, the inner edges with strong spiniform teeth.

In the ♀ the appendages are very large and broad, somewhat triangular, but sub-obtuse. Lateral valves very large, nearly circular.

Length of body, ♂, 5 mm., ♀, 6–7 mm. Expanse, ♂, $14\frac{1}{2}$ –15 mm., ♀, $15\frac{1}{2}$ –18 mm.

As already noticed (p. 322), the type has lost its abdomen; but the Portuguese examples agree so precisely with it in size and colours that I do not hesitate to consider them specifically identical. It is possible that *T. ochreella* and *unanimis* are closely allied.

PLATE IV.—Fig. 1, apex of abdomen of ♂, above; 2, same, from side; 3, last ventral segment, and inferior appendages, beneath; 4, apex of abdomen of ♀, from side.

N.B.—Rambur collected in Spain; but it is not probable that any confusion of localities occurred. Nevertheless, I have seen no further examples of *T. ochreella* from France.

Erotosis (?) *melanella* (*n. sp.*)

Wholly black. (Abdomen, perhaps, greenish in life.) Antennæ and legs with a silky brownish-grey tinge. Wings very densely pubescent.

In the ♂ there are two small conical projections in the middle of the dorsal margin of the last segment. Superior appendages small, flattened, and dilated (but narrow at the base), fringed with very long hairs. Upper penis-cover very large, long, somewhat testaceous, flattened above with a median longitudinal impressed line, and the apex notched so as to be almost bilobate; dilated towards the base: viewed laterally, it is very slightly curved, and directed downward, the sides deflexed: beneath it is deeply concave, and in the cavity lies the stout reddish penis, which is shorter than the cover. Inferior appendages stout, directed upward if viewed laterally, with a thickened lower margin, but otherwise shallowly concave: viewed from above, or ventrally, the tips are seen to be suddenly incurved, somewhat slender, and acute: ventrally they are contiguous in the middle of the margin of the last ventral segment, which is broadly excised with projecting obtuse outer angles.

In the ♀ the parts that appear to represent the appendages are prominent but small, somewhat oblong, with the lower margin inturned; they are fringed with short hairs. Between them is a deep cavity, and below them a triangular horizontal plate, very broad at the base if viewed ventrally, with acute apex (very narrow, if viewed laterally). The true lateral valves are absent or very small.

Length of body, $3\frac{1}{2}$ – $4\frac{3}{4}$ mm. Expanse, 10–12 mm. The ♀ slightly the larger.

Portugal (São Barnabé, Algarve, 12th May, *Eaton*, 4 ♂, 6 ♀).

This is about the smallest European species of typical *Leptoceridæ* known to me. At first sight it might be mistaken for a small form of *Adicella filicornis*; but the more interrupted anastomosis in the anterior-wings, the more prominent anal parts, and the structure of the palpi (so far as this can be made out in dry examples), induce me to place it in *Erotesis* rather than in *Adicella*; it is not typical of either.

PLATE IV.—Fig. 1, neurulation of apical portion of wings; 2, apex of abdomen of ♂, from side; 3, same, beneath; 4, penis-cover (with apex of penis), from side; 5, apex of abdomen of ♀, from side.

Adicella reducta, p. 327, and Supplement, lxv.—Add: Belgium (near Spa, Bouillon and Dinant, July, not common, *McLachlan*); Portugal (near Monchique, Algarve, 19th and 21st May; near Cea, Beira Baixa, 11th June, common; near Villa Real, 25th June, and Ruivães, 29th June, Traz-os-Montes; *Eaton*).

N.B.—In my figure 4, pl. xxxv, the second joint of the inferior appendages of the ♂ is represented too slender, it should be much stouter; in fig. 7, the appendages of the ♀ should be strongly hairy.

Adicella filicornis, p. 328, and Supplement, p. lxvi.—Add: North Italy (between Soje and Bannio, Val Anzasca, 22nd July, *Eaton*, 1 ♀).

Æcetis furva, p. 332, and Supplement, p. lxvi.—Add: Ireland (Co. Monaghan, *Miss A. B. Freeland*, cf. Ent. Mo. Mag., xx, p. 142).

I am of opinion that the "very long slender yellow spine" in the anal parts of the ♂ described at p. 332, and figured on Pl. xxxvi, fig. 2, has no real existence, its supposed presence being due to an adventitious hair from a cleansing brush, or to an ordinary hair having been left isolated in cleaning.

Æcetis lacustris, p. 333.—Add: N. W. Siberia (River Kouda, *Sundman*).

Æcetis testacea, p. 336, and Supplement, p. lxvi.—Add: Portugal (near Alferce, Algarve, 22nd May, 4 ♂, 3 ♀; between Coimbra and São Antonio, Beira Baixa, 3rd June, 1 ♀; *Eaton*); Belgium (between Libin and Bouillon, and near Bouillon, 9th and 10th July, *McLachlan*); Switzerland (Geneva, on the borders of the Lake, 5th July, *McLachlan*); France (Lac de Gérardmer, Vosges, July, *McLachlan*).

Æcetis tripunctata, p. 337.—Add: Belgium (Liège, 8th July, common, *McLachlan*).

SETODES, p. 338.

At p. 339, I indicated that this genus will no doubt be hereafter subdivided. Upon re-examining the species I have discovered a character in the posterior-wings which (with others) enables the species of the genus as it now stands to arrange themselves in two sharply-defined groups (which will be hereafter considered genera).

GROUP I.—Fourth apical cellule in the anterior-wings extending to the anastomosis. *In the posterior-wings apical fork No. 5 has a fold above it, simulating a superposed additional cellule or furcation.** This group comprises *tineiformis*, Curt., *lusitanica*, n. sp., *interrupta*, F., and *similis*, McLach.

GROUP II.—Fourth apical cellule in the anterior-wings *not* extending to the anastomosis. *In the posterior-wings there is no fold above apical fork No. 5.* This group includes *argentipunctella*, McLach., *punctata*, F., and *viridis*, Fourc.

I believe it will also be found that the 1st joint of the maxillary palpi in Group I is shorter than in Group II, but I have not fresh or moist examples of all the species before me, and definition of this point is dangerous if attempted from dry materials only. Differentiating points can also be found in the anal parts.

The peculiar condition of the fold above apical fork No. 5 in the posterior-wings will be readily understood upon referring to the figure for *S. lusitanica* on Plate V of this Supplement. *S. punctata* and allies should be considered typical of *Setodes*.

Setodes lusitanica (n. sp.).

Fuscous or blackish, clothed with hoary hairs (abdomen probably whitish or pale greenish in life). Antennæ fuscous (with a silvery lustre), the basal portion sharply annulated with white (this colour at first occupying the lower half of each joint, but afterwards gradually less extended). Palpi fuscous. Legs silvery-whitish; coxæ fuscous; tarsi with faint darker annulations. Anterior-wings very long and narrow, very acute, clothed with cinereous pubescence slightly mixed with blackish: on the principal longitudinal nervures are rather closely-placed small blackish points (formed of pubescence), and there is a short, blackish, longitudinal, discal line before the apex, and an indication of such at the arculus; round the apical margin are larger blackish points (nearly forming lines at the anal angle); apical fringes cinereous, but becoming blackish, and very long, at the anal angle. Posterior-wings sub-falcate below the apex; dark fuliginous, slightly iridescent, with fuscous neuration and fringes.

In the ♂ the last segment is very large, continuous, coriaceous in texture; finely punctate under the microscope; above, on each side of its middle, are two oval, blackish, hairy patches, leaving a median triangular space of ordinary texture between them; laterally the margins are very deeply excised in a nearly semi-circular manner; ventrally, the segment is nearly oblong, produced at each external apical angle, on each side of which the apical margin is deeply excised, the median portion of this margin rounded, but with a narrow central excision. Possibly there are no true superior appendages. From the middle of dorsal margin of the last segment proceed two very long, spiniform, testaceous, intermediate appendages, strongly curved, extending between and beyond the inferior appendages, the acute tips rather suddenly directed downward. Inferior appendages enormously large, yellowish, inserted close together ventrally: laterally the lower margin appears thickened and has a dense fringe of yellowish cinereous hairs, much curved upward and inward, and ending superiorly in a claw-shaped process directed downward; internally there is a very broad, flattened, or slightly concave dilatation, deeply excised before the point at which it ends below the apex, the whole dilatation forming a thin plate or lamina. Penis and sheaths doubtful (not visible).

♀ unknown.

Length of body, 5 mm. Expanse, 15—17 mm.

* This "fold" occasions such a decided alteration in the membrane that, at first sight, or with insufficient magnifying power, it has all the appearance of a nervure. Careful examination shows that it is continued along the side of the sector that forms fork 5.

Portugal (near São Marcos da Serra, Algarve, 1 ♂; Ponte de Morcellos, Beira Baixa, about 690 ft., 12th June, *Eaton*, about 17 ♂).

A species with some amount of resemblance to *S. tineiformis*, but darker, and the points on the anterior-wings are also darker. The anal structure of the ♂ is very extraordinary.

PLATE V.—Fig 1, neuration of wings; 2, maxillary palpus; 3, base of an antenna; 4, apex of abdomen of ♂, from side; 5, same, beneath; 6, middle of apical margin of last dorsal segment, above; 7, apex of inferior appendage, above. (All, excepting Fig. 1, are from an individual in alcohol).

Setodes argentipunctella, Supplement, p. lxviii.—England (abundant near Ambleside in August, *J. J. King*); Belgium (abundant on the banks of the Semois at Bouillon in July, *McLachlan*).

I amend some points in my former description:—

Head and thorax pale yellowish, with pale hairs; abdomen bright green in life (and this colour ordinarily remains in dry individuals).

In the ♂ the inferior appendages appear to consist of a lower acute elongate-triangular process, continued inwardly at its base, and extended superiorly into a thick, irregularly-shaped, process, which is obtuse and somewhat dilated at its apex. The separation of the curved mass comprising the enormous thickened penis, &c., is difficult; but there are probably slender intermediate appendages proceeding from between the superior appendages, and lower semi-transparent slender sheaths, these parts having the same curvature as, and applied closely against, the penis. (I have not examples in alcohol before me, and without these it is not possible to define the structure accurately).

PLATE V.—Fig. 1, neuration of wings; 2, apex of abdomen of ♂, from side; 3, superior appendages, above.

Setodes punctata, p. 343, and Supplement, p. lxix.—Add: Belgium (Liège, 8th June, common, *McLachlan*).

CALAMOCERAS, p. 346.

Having much additional material (for *C. Volxemi*) before me, and in good condition, I subjoin the following generic notes.

The antennæ are very slightly longer than the anterior-wings (at any rate in the ♂); they are hairy, and at the base and apex of each joint (after the second) internally is a tuft of strong hairs, that at the base simulating a spine or tooth. In the ♂ the abdomen is short and stout: anal parts simple, consisting of large superior appendages, a broad upper penis-cover and stout penis, and up-directed two-jointed inferior appendages. Wings densely clothed with short pubescence; fringes short, excepting towards the base of the inner margin of the posterior: the radius is confluent with the first apical sector in both pairs, and in the anterior it appears also to send a short branch or extension to the costal margin at its apex.

Calamoceras Volxemi, p. 347.—Add the following additional localities in Portugal, viz.: streamlet in the valley at Cintra, near Lisbon, 27th April and 1st June; near Monchique and São Marcos da Serra, Algarve, 18th and 19th May; near Villa Real, Traz-os-Montes, 24th June; *Eaton*, 9 ♂, 1 ♀.

I describe the species anew:—

Head and thorax black, with ochreous clothing. Antennæ ochreous, the spine-like tufts of hairs black, and black hairs indicate the sutures, causing an appearance of annulations. Palpi ochreous, clothed with blackish hairs. Legs ochreous; coxæ fuscous or black. Abdomen fuscescent above, ochreous beneath, anal parts pale. Anterior-wings uniformly and densely clothed with short ochreous pubescence, with short concolorous (or slightly darker) fringes; neuration pale. Posterior-wings smoky, clothed with blackish pubescence, with fuscous fringes and neuration.

In the ♂ the margin of the last dorsal segment is regular. Superior appendages large, broad, elongately-triangular, sub-acute, fringed with very long hairs, concave within. Upper penis-cover, viewed from above, broadly triangular, its apex with a triangular excision, longitudinally carinate in the middle, the sides deflexed; it is shorter than the penis, which lies below it, and is very stout, cylindrical, with an obtuse, truncate, hollow apex. Inferior appendages up-directed, slender, with a median constriction in which is apparently a suture, the apical portion (or joint) being slightly widened, if viewed laterally; viewed ventrally, these appendages are sub-contiguous at point of insertion, but afterwards widely divergent.

In the ♀ there is a very small dorsal triangle, with a small triangular plate on either side of it. Appendages very large, nearly semi-circular if viewed from above, sub-triangular if viewed laterally, fringed with long ochreous hairs. Below these are two polished yellow lateral valves, excised at their truncate tips, and enclosing a deep cavity between them. Last ventral segment as described at p. 348.

Length of body, ♂ ♀, 9—9½ mm. Expanse, ♂, 25—28 mm., ♀, 27—30 mm.

This extremely interesting insect may be likened for colour, and somewhat also for form, to a gigantic *Goëra pilosa*.

PLATE IV.—Fig. 1, neuration of wings; 2, portion of an antenna (much enlarged); 3, apex of abdomen of ♂, above; 4, same, from side; 5, inferior appendage, beneath; 6, apex of abdomen of ♀, above; 7, same, from side.

N.B.—A suspicion now exists with me to the effect that the type of *C. marsupus* (not now before me) may be a ♂, and not a ♀, my description and figures of the anal parts being more in accordance with the conditions seen in that sex of *C. Volxemi*. Furthermore, a careful study should again be made of the much-rubbed type, in order to be quite certain that *Volxemi* is distinct, for I think that the apparent differences in the palpi might possibly be illusory, the proportions of the joints not being very evident in a series of *dry* examples. This I mention in order to draw attention to the subject, the only type of *marsupus*, and the original types of *Volxemi*, being all in bad condition.

Fam. HYDROPSYCHIDÆ.

On the principle adopted for the preceding Families, the Sections are indicated as follows:—

Section of	CESTROPSIS	(= Section i, p. 350).
„ „	MACRONEMA	(= „ ii, p. 353).
„ „	HYDROPSYCHE	(= „ iii, p. 355).
„ „	PHILOPOTAMUS	(= „ iv, p. 373).
„ „	TINODES	(= „ v, p. 408).

Hydropsyche consanguinea (n. sp.).

Allied to *H. pellucidula*. Blackish. Head above mostly reddish, densely clothed with

yellowish-cinereous, as are also the lines on the mesonotum. Antennæ fulvous with distinct oblique black lines in the basal portion. Palpi and legs testaceous. Divisions of the meso- and metanota, and scutellum of the latter, reddish. Anterior-wings shaped as in *pellucidula*; membrane very pale grey, nearly uniformly clothed with cinereous (slightly yellowish) pubescence with the slightest mixture of very pale grey, causing very indistinct irrorations: neuration mostly pale. Posterior-wings pale smoky-greyish, with darker neuration and pale grey fringes.

In the ♂ the anal parts are formed much as in *pellucidula*, but the penis has the apical portion shorter, with the sub-apical angles much less produced and more obtuse if viewed from above. Inferior appendages apparently having the second joint more dilated at the apex, if viewed from beneath.

Length of body, ♂, 7 mm., ♀, 8 mm. Expanse, ♂, 22 mm., ♀, 25—26 mm.

North Persia (in the collection of Max von zur Mühlen, who has presented me with a dozen examples).

I think the structural differences pointed out above are sufficient to establish these specimens as forming a distinct species, although evidently allied to *H. pellucidula*.

PLATE V.—Fig. 1, penis, above; 2, inferior appendage and penis, from side; 3, inferior appendage, beneath.

Hydropsyche lobata (n. sp.).

In size and general appearance much resembling a common form of *H. guttata*, or a small *H. instabilis* (but less strongly marked than is usual with the latter): not unlike a pigmy *H. pellucidula*.

In the ♂ all the anal parts, except the penis, bear considerable resemblance to those of *H. pellucidula* in their general form. The penis seen from above or beneath, has its apex flattened and divided into two divergent, obtuse, piceous lobes, below which is an oval fovea or impressed space; shortly below (or before) the apex the organ is considerably constricted on either side in front of a somewhat angular gradual dilatation of the sides (but not forming a tooth); seen from beneath there is a median longitudinal carina from the base to the apical fovea.

Length of body, 7 mm. Expanse, 20 mm.

Portugal (the Mondego at Ponte de Morecellos, Beira Baixa, 14th June, Eaton, 1 ♂. A ♀ from the same locality probably belongs to the same species; it presents no striking characters).

This species is an ally of *H. pellucidula*, but the form of the penis proves that it cannot be a condition thereof, neither do I know of any other species with a similar formation of this organ; therefore, I feel bound to consider it new, and, on considering the characters, have not hesitated to describe it from the solitary ♂ seen by me.

PLATE V.—Fig. 1, apex of abdomen of ♂, from side (the penis somewhat unnaturally retracted); 2, an inferior appendage, beneath; 3, apex of dorsal plate, and apex of penis, above (more enlarged); 4, penis, from beneath (ditto).

Hydropsyche saxonica (n. sp.).

H. fulvipes, McLach., Rev. and Synopsis, 360, pl. xxxviii, figs. 1—4, *par-tim* (description and figures of the anal parts of the ♂ only), *nec* Curt.

Blackish, clothing golden-grey. Palpi fuscous. Legs dingy testaceous; coxæ fuscous. Wings shaped as in *H. pellucidula*. Anterior-wings pale grey, densely irrorated with pale golden-grey, with two or three pale spaces in the apical fringes; neuration pale fuscous. Posterior-wings pale grey.

In the ♂ the "dorsal plate" has no two-jointed bristles. Inferior appendages having the second joint very short, obtuse at the apex. Penis almost precisely as in *H. fulvipes* and *instabilis*.

Expanse, 25 mm.

Saxony (*Rostock*).

Vide Plate XXXVIII of the "Revision and Synopsis" for figures of the anal parts of the ♂, erroneously indicated "*H. fulvipes*."

This is certainly distinct from *H. fulvipes* (which it should precede), differing not only in the coloration of the wings, but also in the anal parts, especially in wanting the articulated bristles on the dorsal plate of the ♂; in coloration there is resemblance to *H. bulbifera*.

The true *H. fulvipes* also occurs in Saxony.

Hydropsyche fulvipes, p. 360.—I have for some time been aware that two species were confused in the "Revision and Synopsis" under this name:—the general description pertains to the true *fulvipes*, whereas the details for the anal parts, and (unfortunately) the figures on Pl. xxxviii, belong to another species, which I now term *saxonica* (*vide supra*).

H. fulvipes is closely allied to *instabilis* in general structure, and the anal parts appear absolutely identical therewith, but it differs in its broader wings, and especially in colour.

It is widely distributed, and I strongly suspect that the small specimens from the South of Europe alluded to under *instabilis*, at p. 367, and at Supplement, p. lxxi, belong here, or at any rate are only a variety, to which the name *stictica*, Hagen, may be applied, if sufficiently distinct to merit a varietal name, but I have no materials for this before me. On the other hand, a type of *stictica*, Ed. Pictet, from Spain, appears to me to be undoubtedly only *instabilis*.

H. fulvipes and *instabilis* should be placed in juxta-position in the systematic catalogue.

PLATE V.—Fig. 1, apex of abdomen of ♂, from side; 2, dorsal plate, shewing two-jointed bristle, from side.

Hydropsyche instabilis, p. 365, and Supplement, p. lxxi.—This has proved to be so widely distributed that any additional indications of special localities are unnecessary; I may, however, say that I have seen it from Belgium, Portugal, and Central Italy.

Hydropsyche exocellata, p. 367.—Add: Portugal (Ponte de Morcellos, Beira Baixa, 12th June, *Eaton*, 1 ♂, 1 ♀).

Hydropsyche maderensis, p. 367.—Generally distributed in the north of Madeira, in November (*Eaton*); cf. McLach., Journ. Linn. Soc., Zoology, xvi, 158. The examples vary much in size and in intensity of markings. According to the form of the penis it is possible that this species is allied to *H. angustipennis*.

Hydropsyche lepida, p. 371, and Supplement, p. lxxi.—Add: Portugal

(Ponte de Morcellos, Beira Baixa, 12th June, *Eaton*, 2 ♂, 5 ♀; it is desirable that further material be examined, in order to ensure certainty in the identification).

***Hydropsyche* (?) *tibialis* (*n. sp.*).**

♂ unknown.

♀, having the general form and neuration of the larger species of *Hydropsyche*. Maxillary palpi having the 2nd and 3rd joints sub-equal (the 2nd slightly the longer), 4th one-third longer than the 3rd (*the 4th and 5th not dilated*), 5th about the length of the 3rd and 4th united. Intermediate tibiæ and tarsi of the ♀ *not dilated*, long and slender as in the ♂ of *Hydropsyche*.

Body black; head, pronotum, and scutellum of mesonotum clothed with golden-yellow hairs. Antennæ brown, *without oblique* (or spiral) *black lines*. 1st and 2nd joints of maxillary palpi, and the posterior tibiæ (excepting at the extreme base), including the spurs on these tibiæ, *conspicuously pale yellow* (or *yellowish-white*): palpi otherwise fuscous, clothed with silky yellowish adpressed pubescence: legs otherwise black (a tuft of golden hairs at the tips of the coxæ), clothed with silky yellowish adpressed pubescence, which is dense on the tarsi and nearly conceals the ground colour. Anterior-wings (damaged) apparently nearly uniformly greyish-brown, with pale neuration. Posterior-wings apparently smoky-grey.

In the ♀ the anal parts are much as in *Hydropsyche*; the 7th dorsal segment has a large and deep triangular cavity in the dry insect.

Length of body, ♀, 7 mm. Expanse, 21 mm.

Portugal (stream south of Sabugueiro, near São Romão, Beira Baixa, about 4100 ft., 5th June, *Eaton*, 1 ♀).

The ♀ type of this insect has its wings much damaged, but upon detaching them, and floating them out in hot water, the form and neuration appear to coincide with *Hydropsyche* typically. Nevertheless, I incline to think we have here the representative of a *new genus*. The form and proportions of the joints of the maxillary palpi, and the undilated intermediate tibiæ and tarsi of the ♀, are opposed to *Hydropsyche*. Although I have only the one damaged ♀ before me, I have ventured to describe it, in order to point out the structural characters in the legs and palpi, and also because the pale 1st and 2nd joints of the maxillary palpi, and the pale posterior tibiæ, seem to afford striking specific characters that should render the insect recognisable when again met with.

PLATE V.—Fig. 1, maxillary palpus; 2, apex of tibia, and basal joints of tarsus, of intermediate leg of ♀; 3, apex of abdomen of ♀, above (in outline); 4, same, from side.

Diplectrona felix, p. 376, and Supplement, p. lxxi.—Add: Portugal (near Monchique and slopes of Foia, Algarve, 1100—2850 ft., 19th and 20th May; near Villa Real and Salamonde, Beira Baixa, 22nd to 30th June; *Eaton*, 8 ♂, 2 ♀).

Most of the Portuguese examples show a tendency to have the anterior-wings more irrorated than is typical, and, therefore, somewhat approach *D. meridionalis* in appearance.

From the Apennino Pistoiese, Central Italy (between Villa Margherita and San Marcello, 2000—2500 ft., 27th July, and near Ponte del Lima, Valle Sestajone, 4th August, 4130 ft., *Eaton*), I have before me a series (9 ♂, 1 ♀) that differ a good deal from the typical form, and which perhaps represent a good local variety, but hardly a distinct species. They are ordinarily of large size

(expanse, 15—21 mm.), the anterior-wings clothed with dull golden pubescence with only faint pale grey markings (principally on the transverse nervules), but the apical sectors have usually a dark spot at the termination of each in the margin; and the posterior-wings are paler (pale grey).

In my figure 7 on Plate xl, the apex of the penis is represented as truncate; it should have been somewhat rounded; in the cavity at the apex are two shining brown seed-like bodies.

Diplectrona atra, p. 377.—Add the following additional localities: South Tirol (Val di Pejo, 4250 ft., 31st July, *Eaton*); North Italy (Val Furva, 4700 ft., 27th July; Val Camonica, near Darfo and Edolo, 920 and 2930 ft., 4th and 6th August; *Eaton*).

In a series of about 20 individuals the expanse varies from 11 to 17 mm., the ♀ usually the larger. The lateral abdominal filaments are very small in *D. atra* as compared with those seen in *D. felix*.

Philopotamus ludificatus, p. 381.—Add: Apennino Pistoiese, Central Italy (near Boscolungo, about 4500 ft., 1st and 2nd August, *Eaton*, 5 examples).

This species is remarkably constant in coloration, even from widely separated localities, but it varies much in the length of the apical forks in the neuration, entirely irrespective of locality.

Philopotamus perversus (*n. sp.*).

Giving the idea of a small and *very dark* form of *montanus*. Antennæ blackish-fuscous, very indistinctly annulate. Palpi and legs dingy testaceous, almost fuscous. Anterior-wings blackish-fuscous, sprinkled with numerous small golden-yellow spots, all of which are nearly of the same size; fringes blackish, scarcely intersected with golden: apical fork No. 4 with a rather long footstalk. Posterior-wings very dark smoky-grey (almost black), with no pale spots round the apical margin, and the fringes are not intersected with golden.

In the ♂ the external anal parts do not apparently differ from those of *montanus*, but in the inner parts the upper penis-cover is broad at its apex, and conspicuously excised on the apical margin, the blunt angle on either side turned upward.

Expanse, 18—20 mm.

Portugal (near Villa Real and Ruivães, Traz-os-Montes, end of June, *Eaton*, 6 examples).

At first I was inclined to consider this only a melanic form of *montanus*, but apart from the colour-characters italicised in the description, it seems to me that the form of the upper penis-cover entitles it to specific rank; this character is constant in all the individuals. I think *Ph. perversus* should immediately precede *montanus*.

PLATE V.—Fig. 1, apex of abdomen of ♂, from side; 2, upper penis-cover, &c., from above (more enlarged); 3, same, from side (ditto).

Philopotamus montanus, p. 382, and Supplement, p. lxxi.—The examination of a large number of specimens from new localities proves that this species is very variable, and that the variation is, to a considerable extent, due to local influences. This induces me to give some additional varieties indicated by names, and to call attention to others.

In the table at p. 381, I said that apical fork No. 4 in the anterior-wings is “*not petiolate*” in *montanus*, and at p. 383 I said that it is “*rarely petiolate*.” I find, however, that in some localities, this fork is usually shortly petiolate: sometimes this condition is correlated with striking differences in coloration, sometimes not. In many specimens from France (Auvergne) the fork is petiolate, and it is often so in others from the French Pyrenees.

Finland (Jaakkima, *J. Sahlberg*): in the only specimen I have seen, fork No. 4 is shortly petiolate; it is typical otherwise.

From Portugal (Villa Real, *Eaton*) I have four examples that scarcely differ from the type-form, save that the dark ground of the anterior-wings is reddish-brown rather than fuscous: in one of these the apical fork No. 4 reaches the anastomosis, in the others it has a more or less long footstalk. These appear to be quite distinct from the examples from the same locality described above as *Ph. perversus*.

***Philopotamus montanus*, var. *cesareus*.**

Antennæ sharply annulate, fuscous and yellow. Legs pale yellow. Anterior-wings *pale golden-yellow, reticulated and spotted with greyish-fuscous*, a spot at the arculus being larger and more distinct: *apical fork No. 4 reaching the anastomosis*. Posterior-wings very pale grey, with conspicuous golden-yellow spots round the apical margin.

Expanse, 18—20 mm.

Island of Jersey (*W. A. Luff*, 3 ♂, 2 ♀).

This form was alluded to at Supplement, p. lxxi. From its insular habitat and general appearance it appears worthy of a varietal name, for although some specimens from the mainland of Britain show an approach to it, I have not, with one exception, seen any that tolerably agree therewith. The one exception is a ♂ from Clydesdale (*K. J. Morton*); it is slightly larger and the neuration of the posterior-wings is darker.

In bestowing a varietal name on this insect, a doubt may rightly be raised as to whether *Ph. insularis* from the neighbouring Island of Guernsey be entitled to rank as more than a variety of *montanus*. Possibly it should not be so entitled; nevertheless, the anterior-wings seem more decidedly long-oval in form (if this be not an illusion), and their colour is *dull golden-yellow*, with the dark markings much more obliterated.

***Philopotamus montanus*, var. *chrysopterus*.**

Ph. montanus, var. *chrysopterus*, Morton, Ent. Mo. Mag., xx, 273 (1884).

Very similar to the var. *cesareus*. Anterior-wings bright golden-yellow with grey reticulations and fuscous spots, the latter few in number and arranged almost as in *Ph. insularis*: *apical fork No. 4 with a footstalk*. Posterior-wings very pale grey, *nearly their apical half clothed with golden-yellow pubescence*, in which are pale grey reticulations; fringes golden-yellow: neuration blackish, each apical sector, &c., with a small black spot at its termination in the margin, which spots are continued into the fringes, and intersect them.

Expanse, 18—19 mm.

Scotland (on the side of a hill termed “Tinto,” nearly 2000 ft., near Carluke in Clydesdale, *K. J. Morton*, 3 ♂).

A very pretty and interesting form. The anterior-wings are marked almost precisely as in *Ph. insularis*, but they appear to be broader, and their ground colour is bright golden; moreover, apical fork No. 4 extends to the anastomosis in *insularis*. The golden pubescence on the apical portion of the posterior-wings is very remarkable, and in this it approaches the Corsican *Ph. flavidus*. It is singular that so bright a condition should come from so far north.

Mr. Morton does not find the typical form of *montanus* in the locality, and the individual alluded to above, under *var. cesareus*, was, he believes, taken at a low elevation.

In taking leave of *Ph. montanus* for the present, it may be well to state that all the forms have been examined with regard to the *inner* anal parts of the ♂, without the discovery of appreciable differences.

N.B.—I can add nothing further concerning *Ph. siculus* (p. 385), and it is necessary to see examples in good condition in order to establish its claim to specific right.

Philopotamus amphilectus (n. sp.).

Head and pronotum clothed with very bright golden-yellow hairs. Antennæ *uniformly dark brown*. Palpi brown. Legs dingy brownish-testaceous (the posterior paler); anterior and intermediate femora fuscous in certain lights; spurs dark brown. Anterior-wings rather broad; clothed with *rich golden pubescence*, in which are reticulations and large spots of blackish-fuscous, especially round the apical margin (but the amount of spotting and reticulation varies greatly); apical fork No. 4 with a footstalk varying in length: fringes golden, intersected with blackish-fuscous. Posterior-wings smoky-blackish, with darker neuration: a series of golden-yellow spots round the apical margin, sometimes confluent and reticulated with grey.

In the ♂ the external anal parts proportioned almost precisely as in *montanus* (the superior appendages, perhaps, larger and broader): inner parts more as in *variegatus*, totally yellow; upper penis-cover very obtuse and turned upward if viewed laterally; penis (?) broad, produced into a fine point, concave beneath; sheaths very slender, flattened-spiniform, very acute and slightly up-turned at the tips.

Expanse, 22—27 mm.

Mountains of the Estrella, Portugal (near Cea, 1792 ft., 4th June, 5 ♂, and near Sabugueiro, 4100 ft., 5th June, 1 ♂, Beira Baixa; *Eaton*).

A large and very handsome species, agreeing with *montanus* in the form of the external anal parts, and practically with *variegatus* in the inner anal parts, but seemingly quite distinct from both: agreeing also with *variegatus* in the unicolorous antennæ, but these are brown instead of yellow. The amount of dark reticulation and spotting on the anterior-wings varies very much; in some specimens it is nearly as much reduced as in *insularis* and *flavidus*, in others it approaches the normal condition of *montanus*.

PLATE V.—Fig. 1, apex of abdomen of ♂, from side; 2, upper penis-cover, &c., from side, more enlarged.

Var. Antennæ pale brown, indistinctly annulate with darker. Anterior-wings blackish-fuscous, thickly irrorated with small golden-yellow spots (almost as in normal *montanus* and *ludificatus*): apical fork No. 4 scarcely petiolate. Posterior-wings having the apical marginal spots nearly obsolete, and almost confined to the fringes. External and inner anal parts as in the others.

Portugal (near Villa Real, Traz-os-Montes, 22nd June, *Eaton*, 1 ♂).

On account of its more normal condition of coloration it is possible this should be regarded as the type-form; it is interesting as shewing the apparent influence of locality, but more materials are necessary.

Philopotamus variegatus, p. 385, and Supplement, p. lxxi.—Add: Belgium (near Bouillon, 10th July, *McLachlan*, 1 very small dark ♂, expanding to only 19 mm.); North Italy (Val Anzasca, 18th July, *McLachlan*, 1 ♂; in this example the antennæ are faintly annulate).

N.B.—I have seen no further examples of the supposed *var. hispanicus* (p. 386).

Dolophilus copiosus, p. 388, and Supplement, p. lxxii.—Add as localities: France (Remiremont and Retournemer, Vosges; Gex, Ain; July, *McLachlan*); North Italy (Val Anzasca, July, rare; Val Cannobbio, 21st July, 1 ♂; *McLachlan*); Central Italy (various localities in the Apennino Pistoiese, end of July and beginning of August, *Eaton*, sparingly).

***Dolophilus corvinus* (*n. sp.*).**

Black; hairs of head and pubescence of anterior-wings with a slight brownish tinge. Median tubercles on the head triangular. Antennæ black. Legs fuscous, with a slight testaceous tinge.

In the ♂ the margin of the last dorsal segment is *regularly and shallowly excised*. Superior appendages very long, dilated at the base, but gradually arcuate and acuminate if viewed laterally. Upper penis-cover lanceolate, extending to between the apices of the inferior appendages, its apex slightly upturned. Inferior appendages *short and broad*, the second joint scarcely narrower than the first, *only very slightly longer than broad*, its apex very obtuse.

In the ♀ the apex of the abdomen presents no special (other than generic) peculiarities.

Size of *D. pullus*, or slightly smaller.

Portugal (near São Romão, Cea, Beira Baixa, 1792 ft., 9th June, *Eaton*, 1 ♂, 1 ♀).

Allied to *D. pullus* by the dark coloration, which is intensified: differs in the anal parts of the ♂, especially in the form of the margin of the last dorsal segment, and in the very short and broad second joint of the inferior appendages.

PLATE V.—Fig. 1, apex of abdomen of ♂, from side.

Wormaldia triangulifera, p. 390, and Supplement, p. lxxii.—I refer here examples from the following localities, all of which appear to present an amount of excision of the last dorsal segment in the ♂ sufficient to separate them from *occipitalis*:

North Italy (Val Anzasca, in July, common, *McLachlan* and *Eaton*); Central Italy (Apennino Pistoiese, various localities, July, *Eaton*).

Wormaldia mediana, p. 391.—I refer here examples from the following localities:

Central Italy (Apennino Pistoiese, in July, *Eaton*). The examples are dark, but do not appear to have the same form of wing as *subnigra*.

North Italy (Val Anzasca and its lateral valleys, very common in July, *McLachlan* and *Eaton*). The same remark as to colour and form applies to these.

Portugal (Cea and Ponte de Morcellos, Beira Baixa, 11th and 14th June; Villa Real, Traz-os-Montes, 22nd June; *Eaton*, 8 examples). Some of these (especially those from Villa Real) are very dark, still they do not appear to me to be identical with *subnigra*; the amount of excision of the last dorsal segment in the ♂ varies.

N.B.—Also from Portugal (near Villa Real, and near Salamonde, 24th and 30th June, *Eaton*) I have 2 ♂ that remain very doubtful. They agree with *occipitalis* in size and colour, and in the unexcised margin of the last dorsal segment, but the inferior appendages seem to be formed as in *mediana* and *subnigra*. The specific characters in this genus are slight, and not always easy to seize.

Plectrocnemia geniculata, p. 396, and Supplement, p. lxxii.—Add: North Italy (Val Anzasca, 13th July, *McLachlan*, 1 ♂).

***Plectrocnemia inflata* (n. sp.).**

Reddish-testaceous (or ferruginous). Head and pronotum above clothed with dense reddish-yellow hairs in the middle, which become black on the sides and on the wing callosities. Antennæ yellow, with the faintest indications of darker annulations. Palpi and legs yellow; spurs reddish. Anterior-wings densely irrorated with more or less confluent yellow spots (with a ferruginous tinge), in which the ordinary dark markings are blackish-fuscous (the membrane, without the pubescence, is pale grey); fringes reddish-yellow. Posterior-wings pale grey, with grey fringes, which are slightly yellow in the apical portion.

In the ♂ the upper penis-cover is short; above it appears as two triangular points projecting from beneath, a shorter membranous plate. Superior appendages small and triangular, fringed with long hairs. Intermediate appendages (?) small, nearly conical with truncate apex. Beneath the upper cover are probably a pair of short penis-sheaths, which have the appearance of being sinuate on their lower edge. Inferior appendages very large, hairy, inserted somewhat distantly on the ventral margin; the basal portion very broad, deeply concave within, which gives it an inflated appearance; the apical portion slender, turned very strongly inward in an almost geniculate manner, very slightly dilated beyond the constriction. At the base of the upper edge of these appendages, viewed laterally, is a slender, slightly-curved supplementary appendage, gradually widened from apex to base. All the anal parts are yellow.

♀ unknown.

Length of body, 7 mm. Expanse, 22 mm.

Portugal (stream westward of Villa Real, Traz-os-Montes, 1280 ft., 24th June, *Eaton*, 1 ♂).

In the structure of the inferior appendages this is allied to *P. geniculata*, but even these differ in the basal portion being more inflated, the apical portion shorter, and the whole less suddenly geniculate; the other anal parts differ considerably from those of *geniculata*, and the bright (almost ferruginous) general coloration of the wings and body is very distinct therefrom. (N.B.—It may be that the inferior appendages of *geniculata* are not truly bi-articulate; in *inflata* I detect no suture at the constriction before the slender apical portion).

PLATE V.—Fig. 1, apex of abdomen of ♂, above; 2, same, from side; 3, an inferior appendage, beneath (slightly less enlarged).

Plectrocnemia præstans (*n. sp.*).

Black. Head and pronotum clothed with golden-yellow hairs, becoming blackish on the sides and on the face. Antennæ yellow, faintly annulate. Palpi fuscous, pale at the articulations. Legs yellow. Anterior-wings grey, densely irrorated with small rounded golden-grey spots, and almost without darker markings, excepting a few blackish-fuscous indications in the pterostigmatic region: neuration dark fuscous: fringes grey. Posterior-wings smoky-grey, with fuscous neuration and grey fringes.

♂ unknown.

In the ♀ the appendages of the 8th ventral segment are transverse, each produced into a point internally, the upper edge nearly straight, the outer edge very oblique.

Length of body, ♀, 8½ mm. Expanse, 29½ mm.

North Italy (near Bannio, Val Anzasca, 22nd July, *Eaton*, 1 ♀).

Ordinarily it would be very imprudent to describe a *Plectrocnemia* from the ♀ only, but the form of the appendages of the 8th ventral segment is so utterly different from that of any other species of which this sex is known, that I do not hesitate to describe this individual. Moreover, the very large size renders improbable its connection with any species of which the ♀ is unknown. From its size, colour, and markings, it might readily be mistaken for *Rhyacophila proxima*.

PLATE V.—Fig. 1, apex of abdomen of ♂, beneath.

Plectrocnemia conspersa, p. 394, and Supplement, p. lxxii.—Add: Belgium (near Dinant, 14th July, *McLachlan*, 1 ♀; Switzerland (near St. Moritz, Engadine, 6000 ft., August, *McLachlan*, 1 ♂).

Plectrocnemia conspersa, *var. breviscula*.

Probably presenting no tangible differences from the type, excepting in the inferior appendages of the ♂, which are distinctly shorter, with their apices less produced, more regular in outline, and less attenuated.

North Italy (Lago di Silissi, Val Mazza, Lombard Alps, 5500 ft., 29th July, *Eaton*, 5 ♂, 4 ♀; Macugnaga at the head of the Val Anzasca, over 5000 ft., 14th July, *McLachlan*, 1 ♂, 2 ♀).

I have long hesitated between describing these individuals as a new species and uniting them with *conspersa*. I adopt the middle course by considering them provisionally a variety of the latter. The distinctness is not notable; yet, in regarding a long series, the shortness of the inferior appendages of the ♂ is evident, and apparently constant; and it is not the shortness only, for the tips of these appendages seem to differ in outline.

PLATE V.—Fig. 1, inferior appendage, in outline, beneath; 2, same, from side, more enlarged (Figs. 3 and 4, the same of *conspersa*-type, for comparison, drawn to the same scale).

Plectrocnemia brevis, p. 396.—It appears to me probable that the example (♂) from Bergün (*cf.* p. 397) is perhaps distinct from *brevis*, which would thus be limited to the types from Sedrun. A second ♂, from the Pyrenees (without indication of the precise locality), is probably specifically identical with that from Bergün. Possibly we have here the representatives of a new

species intermediate between *brevis* and *scruposa*, differing from the former in the much less prominent and shorter penis (or penis-cover?), and from the latter in the unexcised apices of the inferior appendages. I do not think it prudent to decide at present.

Plectrocnemia lætabilis, Supplement, p. lxxiii.—Add: Portugal (near Villa Real, Traz-os-Montes, 22nd June, *Eaton*, 1 ♂). The markings of the anterior-wings are rather more pronounced than in the Pyrenean types, in consequence of the ground-colour being darker (blackish-fuscous instead of greyish-fuscous).

Plectrocnemia appennina (*n. sp.*).

Fuscescent; pronotum, metanotum, and base of abdomen above inclining to reddish; under-side yellowish. Head and pronotum with reddish-golden hairs, becoming blackish on the sides. Antennæ yellow, with very faint darker annulations. Palpi and legs yellow. Anterior-wings grey, densely irrorated with golden-yellow spots, and with darker blackish clouding, especially on the transverse nervules: neurulation dark fuscous. Posterior-wings smoky-grey, with grey fringes and fuscescent neurulation.

In the ♂ the dorsal plate appears to be formed of two portions, the upper rather narrow in its basal portion; its apex divided into widely divergent branches, forming a \neg : the lower very broad, concave above, chitinous, deeply excised in the middle of its apical edge, each side produced into a broad plate, provided with coarse teeth on the outer edge, and produced downward into an acute point. Between the dorsal plate and the upper cover are two very strongly curved strong spines meeting in the excision of the upper cover, and then suddenly curved outward and very acute at the tips. Upper penis-cover only visible in front, directed downward between the inferior appendages, very concave, broad at its base, afterwards narrowed, the edges raised and thickened. Superior appendages long-oval, yellow, very strongly fringed. Inferior appendages rather short, broad, very obtuse, concave within, curved upward, yellow; at the base of the upper edge (connected therewith?) is a rather small supplementary appendage, having its upper edge prolonged.

In the ♀ the appendages of the 8th ventral segment are in the form of long-oval plates, convergent at the tips.

Length of body, ♂, 7 mm., ♀, 8 mm. Expanse, ♂, 22 mm., ♀, 25 mm.

Apennino Pistoiese, Central Italy (between Villa Margherita and San Marcello, 27th July, *Eaton*, 1 ♂, 1 ♀).

Of ordinary general appearance, but very remarkable on account of the extraordinary "dorsal plate" in the ♂, which is of such a nature as to almost defy description, and which can be best understood by reference to the figures. In the inferior appendages the species approaches *P. brevis*.

PLATE V.—Fig. 1, apex of abdomen of ♂, above; 2, "dorsal plate," beneath; 3, apex, from side; 4, an inferior appendage, beneath; 5, apex of abdomen of ♀, beneath.

N.B.—I think it is both just and convenient to consider *geniculata* the type of *Plectrocnemia*, Stephens (*cf.* p. 396). Therefore, I propose the following sequence of species:—*geniculata*, *inflata*, *præstans* (position doubtful), *conspersa*, *brevis*, *scruposa*, *lætabilis*, *appennina*; the last-named apparently shewing an approach towards *Polycentropus* in some points of its anal structure.

Polycentropus Kingi.

P. Kingi, McLach., Ent. Mo. Mag., xvii, 254, figs. 1, 2, append. (1881).

In size and general appearance much resembling *P. flavo-maculatus* and *multiguttatus*. The dark portions of the anterior-wings more pronounced, especially the spots on the costal margin; apical fork No. 3 in these wings sessile, or with a more or less long footstalk.

In the ♂ the dorsal plate is oblong, concave above, with the sides upturned, causing the apical margin to appear as if excised. Superior appendages rather short, yellow, the upper edge longer than the lower, so that the apical edge is very oblique. Intermediate appendages strongly divergent, flattened, rather broad, not very much curved, gradually attenuate to the acute apex. Inferior appendages not often visible in the dry insect, moderate, sub-oblong, convex externally, very hairy, the apical margin excised, and there is an appearance as of an inturned inner portion: from the base of the upper margin proceeds a lanceolate yellow, slightly curved, hairy supplementary appendage. Penis very long and stout, yellow, directed downward between the inferior appendages, very obtuse, and at its apex there is a kind of attached process curved over the back.

Length of body, ♂, 5—6 mm., ♀, 5½—6½ mm. Expanse, ♂, 14½—18 mm., ♀, 17—21 mm.

Scotland (Strathglass, Inverness-shire, August, *J. J. King*, very abundant); England (near Ambleside, August, *J. J. King*); Portugal (slopes of Foia, and another locality near Monchique, Algarve, 19th and 21st May; near Alferce, Algarve, 22nd May; near Cea, Beira Baixa, 11th June; *Eaton*, 3 ♂, 1 ♀).

Certainly distinct from the previously described species on account of the anal structure of the ♂, the penis being very extraordinary. It is necessary that individuals in alcohol be examined for more correct discrimination, for amongst many dry individuals I could find only one that appeared to give a tolerably clear idea of the structure of the inferior appendages. The Portuguese examples are larger than the British, but they appear to agree therewith in points of structure.

N.B.—It is possible that a still larger pair from Villa Real, Portugal (*Eaton*, 22nd June) belong here.

A small ♂ from the Island of Sardinia (Porto Torres, *Costa*) is referred here with doubt.

PLATE V.—Fig. 1, apex of abdomen of ♂, above; 2, same, from side.

Polycentropus corniger (n. sp.).

Generally resembling the last, and other allied species; apical fork No. 3 in the anterior-wings apparently always provided with a short footstalk.

In the ♂ the dorsal plate is whitish or pale yellowish, *deflexed nearly vertically*, slightly rounded at the base, then gradually dilated, the apical margin deeply excised, *each angle produced into a long horn-like divergent process*. Superior appendages long, yellowish, hairy, also deflexed, somewhat broad at the base, but *gradually narrowing to the apex, which is strongly incurved and acute if viewed from above*; on the upper edge, near the base, is placed a *very slender, much curved, yellowish spine*. Intermediate appendages sub-cylindrical, yellowish-testaceous, *very long and slender*, and *excessively curved* almost in a semicircular manner. Inferior appendages rather small, very hairy, consisting of an outer obtuse convex portion, much excised on its apical margin, and an inturned inner concave portion, the cavity of which appears blackish. Penis, &c., not visible in dry examples.

Length of body, ♂, 4½—5 mm., ♀, 5—5½ mm. Expanse, ♂, 13—13½ mm., ♀, 17—18 mm.

Portugal (near Villa Real, Traz-os-Montes, 21st and 23rd June, *Eaton*, 5 ♂, 3 ♀); French Pyrenees (near Quillan, Aude, 8th July, *Eaton*, 1 ♂).

Identification of this species should be easy, in consequence of the very peculiar points in the anal structure of the ♂. (I omit allusion to this structure in the ♀ in this, and other species, because I do not yet appreciate sufficiently intelligible characters in that sex; at present, local association is the chief point relied upon).

The example of *P. corniger* from the French Pyrenees remained undescribed when the "Revision" was completed, owing to insufficient materials.

PLATE VI.—Fig. 1, apex of abdomen of ♂, above; 2, same, from side; 3, dorsal plate and intermediate appendages, in front (less enlarged); 4, an inferior appendage, beneath.

Polycentropus telifer (*n. sp.*).

Of the ordinary form, colours, and size. The golden-yellow irrorations on the anterior wings are perhaps paler (almost whitish-yellow) than is usual; apical fork No. 3 in these wings apparently always with a footstalk.

In the ♂ the dorsal plate is short and broad, almost transversely oblong, the apical margin excised, the sides slightly more dilated at the base than at the extremity, the apical angles slightly produced. Superior appendages yellow, hairy, somewhat transversely oblong, the apical margin slightly irregular and excised; viewed laterally there appears to be a supplementary process proceeding from their lower edge. Intermediate appendages testaceous, *comparatively short*, slender, spiniform, *not much curved*, and extending less than usual beyond the dorsal plate. Inferior appendages hairy, *long, lanceolate, upcurved, acute at the tips*, concave within; viewed ventrally they are inserted close together, and each is broad at its base, but gradually attenuate to the apex. Penis *long, rather stout, much exerted*, slightly curved and not deflexed, flattened and concave above, the median portion forming a kind of central keel, which is slightly produced in the middle of the otherwise excised apical margin, and on either side of it, at the apex, is inserted a minute, curved, brown, corneous tooth.

Length of body, ♂, 5 mm. Expanse, ♂, 16 mm.

Portugal (stream near Agualva on the road to Cintra, Estremadura, 31st May, 3 ♂; river Corgo, near Villa Real, Traz-os-Montes, 23rd May, 1 ♂; *Eaton*).

No other known species of *Polycentropus* possesses inferior appendages after the nature of this, and the other anal structure is equally characteristic.

PLATE VI.—Fig. 1, apex of abdomen of ♂, above; 2, same, from side.

N.B.—These additions to *Polycentropus* prove that the genus, as restricted, is one of the most natural; they prove the practical impossibility of separating the species by any intelligible characters of form, colour, or size; they prove also the very great value of careful examination of the anal parts of the ♂, which present wonderfully good characters, although the same *general* structure is indicated throughout.

Cyrnus cintranus (*n. sp.*).

In general form, colours, and structure, resembling a large form of *C. trimaculatus*; discoidal cell about the same length as the apical fork No. 2; median cellule as in *C. trimaculatus*.

In the ♂ the principal difference in the anal parts appears to be in the so-called "branches of the dorsal plate;" which are much stouter or broader, ordinarily closely applied one against the other.

Length of body, 5½—6½ mm. Expanse, ♂, 15—15½ mm., ♀, 17—18 mm.

Portugal (Cintra, Estremadura, 26th to 30th April, *Eaton*, 3 ♂, 2 ♀; it appears probable that a ♀ from near Monchique, Algarve, 19th May, also belongs here).

Although undoubtedly very close to *C. trimaculatus*, it seems probable that these Portuguese examples are really distinct therefrom on account of the larger size, and the apparent difference in the anal parts noted above.

PLATE V.—Fig. 1, apex of abdomen of ♂, above; 2, same from side.

Cyrnus flavidus, p. 407.—Specimens from the extreme north of the mainland of Scotland (Tongue, Sutherlandshire, *J. J. King*, very abundant) differ somewhat from the typical form. They are smaller on an average; the anterior-wings clothed with very pale yellowish pubescence, without any trace of darker reticulations; posterior-wings white; antennæ brown above in the basal third, otherwise pale. In other respects they do not appear to differ from the type-form.

Ecnomus tenellus, p. 410.—The discovery of a second species of this genus (*vide infra*) induced me to re-examine the materials for *tenellus*, especially as they are from widely-separated localities. I find no differences. The description of the inferior appendages at p. 411, and the figures on pl. xliii, are scarcely sufficient. When these appendages are visible, they are seen to be elongate, flattened, the apex curved inward; on the inner margin, beyond the middle, is a projecting obtuse tooth that seems to arise from a kind of cavity on the inner face of the appendage. (This is faintly indicated in fig. 3 on pl. xliii; but to render it more understandable, I give here a separate figure).

PLATE VI.—Fig. 1, an inferior appendage of ♂, beneath, somewhat internally.

Ecnomus deceptor (*n. sp.*).

Apparently presenting no tangible differences in size and general appearance from *E. tenellus*.

In the ♂ the anal parts are distinctly different. Superior appendages *short, nearly oblong*; at the apex there is a small inturned portion provided with blackish spines or teeth (internally, near the base, seldom visible, is a stout, curved, somewhat flattened spine). Inferior appendages *projecting much beyond the superior* (if extended), hairy, broad, lanceolate, acute, curved inward, articulated to a long and broad basal piece (or ventral segment). The appearance of the anal parts varies very greatly according to the degree in which they are extended, or closed upon each other; in the latter case the apex of the abdomen appears almost obtuse.

♀ unknown at present.

Portugal (Ponte de Morcellos, Beira Baixa, 12th June, *Eaton*, 1 ♂); Belgium (Bouillon and Dinant, 9th and 12th July, *McLachlan*, 3 ♂).

Undoubtedly very distinct from *tenellus* by the anal parts of the ♂, although otherwise apparently undistinguishable therefrom.

In the *Comptes-Rendus Soc. Ent. Belg.*, xxv, p. cxxxii, I erroneously recorded the Belgian examples as *tenellus*, which error is rectified in the *Comptes-*

Rendus, xxvi, p. lxxviii. As the species evidently has a wide distribution, Trichopterists should carefully examine their examples of *tenellus* with a view to discovering if *deceptor* may not be mixed therewith.

PLATE VI.—Fig. 1, apex of abdomen of ♂ (with superior appendages only), above; 2, apex, from side; 3, a superior appendage, internally.

Tinodes wæneri, p. 413.—Add: Portugal (near Cintra, Estremadura, 27th and 30th April, 31st May, and 1st June, 1 ♂, 5 ♀; Almodovar, Alemtejo, 6th May, 2 ♂, 2 ♀; *Eaton*); the examples fully equal or exceed the largest British specimens.

M. Forel, of Morges, considers that the action of the larvæ of this insect is one cause of the curious sculpturings on limestone pebbles found on the shores of Swiss lakes. Cf. Bull. Soc. Vaud., xi, Proc. verb., p. 29.

Tinodes aureola, p. 415, and Supplement, p. lxxiii.—Add: Island of Sardinia (Mt. di Desulo, *A. Costa*, 1 ♂); Central Italy (Apennino Pistoiese, July, *Eaton*, not rare); North Italy (Val Anzasca, July, *McLachlan* and *Eaton*, very common; Val Cannobbio, July, *McLachlan*).

Tinodes assimilis, p. 416, and Supplement, p. lxxiv.—Add: Portugal (Cintra, Estremadura, 27th April; near Monchique, Algarve, 18th and 19th May; near Cea, Beira Baixa, 11th June; near Oporto, 18th and 20th June; *Eaton*, many examples); Remiremont, Vosges (July, *McLachlan*).

Tinodes grisea, p. 414.—Add to the bibliography: *McLach.*, Journ. Linn. Soc., Zoology, xvi, p. 159 (with description of presumed ♂).

Amongst a host of examples of *T. cinerea* collected by *Eaton* in Madeira in November, I found two ♂ that probably belong here, and if so, the affinity with *cinerea* is much greater than anticipated.

Clothing of head and anterior-wings entirely golden.

In the ♂ the arrangement of the anal parts is quite after the same plan as in *cinerea*; the principal difference consists in the parts termed (perhaps erroneously) "intermediate appendages." In *cinerea* these parts, viewed laterally, are sub-cylindrical, not dilated, and regularly curved downward; in *grisea* (viewed in the same position) they are *much dilated and somewhat flattened in the apical portion*, with a conspicuous tooth (distinct from the spines) that seems to escape from between the two appendages. The processes of the inferior appendages stronger, especially the process of the lower edge, if viewed from beneath.

Expanse, ♂, 14—16 mm.

Naturally there must exist some amount of doubt as to the right of these ♂ to be coupled with the typical ♀, but I think such a relationship is very possible.

PLATE VI.—Fig. 1, apex of abdomen of ♂, from side; 2, "intermediate appendages," &c., from side (the superior appendage, &c., removed); 3, process of lower edge of an inferior appendage, beneath.

Tinodes cinerea, p. 414.—Add to the bibliography: *McLach.*, Journ. Linn. Soc., Zoology, xvi, p. 159.

Taken abundantly by *Eaton* in Madeira in November; the examples vary greatly in size, irrespective of sex (expanse, 10½—16 mm.).

PLATE VI.—Fig. 1, "Intermediate appendages," &c., from side.

Tinodes canariensis.

T. canariensis, McLach., Journ. Linn. Soc., Zoology, xvi, 159 (1882).

Very closely allied to *T. cinerea*.

In the ♂ the superior appendages are not perceptibly dilated toward the base, almost filiform throughout. The intermediate appendages appear to have a process below the apex, slightly exceeding them in length. The process of the lower edge of the inferior appendages very slender, greatly curved, its apex obliquely pectinate (*i. e.*, with four or five teeth gradually decreasing in length from the uppermost).

Canary Islands (stream beyond San Mateo, Grand Canary, 4550—4650 ft., 11th December, *Eaton*, 1 ♂).

The differences noted (especially the undilated superior appendages), and the locality, render it possible that this is really distinct from *T. cinerea*, although undoubtedly very closely allied thereto.

PLATE VI.—Fig. 1, apex of abdomen of ♂, from side; 2, process of lower edge of an inferior appendage, beneath; 3, same, from side (much enlarged).

Tinodes maculicornis, p. 417, and Supplement, p. lxxiv.—Add: Portugal (Cintra, Estremadura, 27th April, 31st May, and 1st June, *Eaton*, many examples).

Tinodes unicolor, p. 418, and Supplement, p. lxxiv.—Add: Belgium (near Dinant, in July, *McLachlan*, abundant); Switzerland (near Sierre, Valais, 8th July, *McLachlan*); Greece (Attica, *C. W. Dale*); Central Italy (Apennino Pistoiese, July, *Eaton*, common).

Tinodes Zelleri, p. 420.—Add: Switzerland (Vispthal, Valais, 11th July, *McLachlan*, 2 ♂).

Tinodes merula.

T. merula, McLach., Journ. Linn. Soc., Zoology, xvi, 160 (1882).

Almost totally deep black, including the clothing of the head, thorax, and wings. Antennæ narrowly annulated with yellowish. Articulations of tarsi narrowly yellowish. Anterior-wings having the apex slightly elongate; apical fork No. 3 long and narrow, No. 4 very long and broad; membrane iridescent.

♂ unknown.

In the ♀ the ovipositor is testaceous, shorter in proportion than in most other species.

Expanse, 12—13 mm.

Madeira (streamlet between Cama dos Lobos and Cabo Girão, 1780 ft., 20th November, 1 ♀; "levada" above Funchal, 3100 ft., 23rd November, 1 ♀; *Eaton*).

Although, as I have previously stated (*loc. cit.*), it is very dangerous to describe species of *Tinodes* from the ♀ only, there can be little doubt that this is distinct, the *black* species being so few.

PLATE VI —Fig. 1, neurulation of apex of an anterior-wing; 2, apex of abdomen of ♀, from side.

***Tinodes fœdella* (*n. sp.*).**

Blackish or fuscous; abdomen paler (somewhat ochreous) beneath; clothing of head and thorax blackish, with a reddish-brown tinge. Antennæ stout for the size of the insect, blackish or fuscous, the sutures of the articulations paler, distinctly crenulate within. Palpi fuscous. Legs dingy testaceous; tibiae and tarsi fuscous externally, paler at the articulations; spurs

fuscous. Anterior-wings broad, rounded at the apex; membrane grey, densely clothed with blackish-fuscous pubescence, having a reddish-brown tinge in certain lights; fringes concolorous with the pubescence, long. Posterior-wings dark grey, iridescent, with grey pubescence and fringes, the latter very long.

In the ♂ the dorsal plate forms a broad triangle. Superior appendages yellowish, very long and slender, slightly curved, and very slightly dilated toward the base, clothed with long blackish hairs. Intermediate appendages apparently separate, parallel, straight, each having two or three long spines near, and at, the base, and a terminal spine; below them are apparently several slender processes, one of which is very strong, curved in a sinuous manner, another is regularly and slightly curved downward between the inferior appendages (simulating the penis, but probably not that organ). Inferior appendages having a very large, somewhat oval, basal piece or joint, yellowish, and clothed with black hairs; its lower edge prolonged into a short straight process, somewhat angulate at the tip; the second joint long and slender, slightly curved, obtuse, and somewhat dilated at the tip (much longer than the lower process). Penis apparently stout and much curved, mostly concealed between the inferior appendages.

♀ with a very long and slender, testaceous, slightly-curved, ovipositor.

Length of body, about $2\frac{1}{2}$ — $2\frac{3}{4}$ mm. Expanse, 7 — $8\frac{1}{2}$ mm.

Portugal (stream from the Estrella, near São Romão, about 2450 ft.; near Cea, 1800 ft.; near Villa Real; and near Salamonde; in June; *Eaton*, 22 examples).

By far the smallest *Tinodes* known to me, and an addition to what may be termed the group of "black" species. As the anal structure of the ♂ appears to be somewhat analogous to that of *T. Rostocki* (although differing much in minute detail), its position should probably be near that species.

PLATE VI.—Fig. 1, neurulation of wings; 2, dorsal plate, superior and intermediate appendages, &c., of ♂, above; 3, apex of abdomen of same, from side; 4, same of ♀, from side.

Tinodes dives, p. 421, and Supplement, p. lxxiv.—Add: Central Italy (near Ponte del Lima, Apennino Pistoiese, 5th August, *Eaton*, 1 ♂).

***Lype auripilis* (n. sp.).**

Fuscous, paler beneath; clothing of head, &c., blackish, slightly mixed with golden. Antennæ fuscous, narrowly annulated with testaceous. Palpi fuscous. Legs dingy testaceous; tibiæ and tarsi fuscous, the latter faintly annulated with pale; spurs fuscous. Anterior-wings densely clothed with blackish-fuscous pubescence which is strongly mixed with golden, and somewhat congested into spots of that colour, whereof one on the discoidal cell is the most conspicuous; fringes concolorous, very slightly mixed with golden: neurulation much as in *L. phæopa*, but apical fork No. 2 appears to extend further inwardly, and the transverse nervule below the discoidal cell is placed nearly at the base of this fork. Posterior-wings blackish-grey, with concolorous fringes.

In the ♂ the dorsal plate thick, boat-shaped if viewed laterally, not at all attenuate toward the apex. Upper penis-cover thick, occupying most of the inner portion of the apex of the abdomen, apparently divided if viewed from above, extending beyond the dorsal plate. The part termed the "penis" (in former descriptions) thick, semi-transparent, with a tooth (perhaps the true penis?) projecting from its upper edge. Superior appendages slender if viewed laterally (because only their edge is seen), broader and flattened if viewed from above, sub-obtuse, slightly narrowed at the base. Inferior appendages with a short dilated basal joint, and a long, thinner, slightly-curved, second joint; viewed ventrally the basal joints of these appendages are separated by a long deep excision, the second joints incurved, and dilated at the apex. All the anal parts are yellowish, the superior and inferior appendages clothed with black hairs, which are very long on the former.

♀ unknown.

Length of body, about 3 mm. Expanse, about $10\frac{1}{2}$ mm.

Portugal (stream south of Monchique, 1400—1500 ft. 19th May, and slopes of Foia, about 1600 ft., 21st May, Algarve, *Eaton*, 3 ♂).

Allied to *L. phæopa*, but very distinct in consequence of the form of the "dorsal plate," and the partially golden pubescence of the anterior-wings; in this latter character it forms a sort of parallel to the case of *T. dives* in the genus *Tinodes*. In rubbed examples the golden hairs would no doubt disappear wholly or partially.

PLATE VI.—Fig. 1, neuration of apical portion of an anterior-wing; 2, dorsal plate, superior appendages, &c., of ♂, above; 3, apex of abdomen of same, from side.

Lyte sinuata, p. 424.—As there appears to be a tendency to variation (probably to some extent local) in the form of the "dorsal plate" in *L. phæopa* (*cf.* Supplement, p. lxxiv), it is just possible that *sinuata* may be only an extreme form thereof. I have seen no further examples.

Lyte reducta, p. 424, and Supplement, p. lxxv.—A ♂ from Portugal (Aqualva, near Cintra, 31st May, *Eaton*) possibly belongs here. The "dorsal plate" is longer, more slender, and slightly curved downward; in this character it agrees with the example from Saxony mentioned at p. lxxv.

Psychomyia pusilla, p. 426.—I do not feel certain as to the absolute identity of six specimens from Portugal (Oporto, Villa Real, Ruivães, and Ponte de Morcellos, *Eaton*) with this species. Although altogether resembling it in general characters, the inferior appendages of the ♂ appear to be formed more as in *Ps. ctenophora* (described below); but they want the essential character from which the name of the latter is derived.

N.B.—The discovery of *Ps. ctenophora* induced me to re-examine the whole of the specimens (from many and widely-separated localities) placed in my collection as *Ps. pusilla*. I think all form but one species, and, as bearing upon the application of the specific term *pusilla*, it may be mentioned that the examples from Turin (*cf.* p. 427) are included; these latter are somewhat larger than usual, but I have equally large individuals from Switzerland.

Psychomyia ctenophora (*n. sp.*).

Apparently not to be separated from *Ps. pusilla* by any characters of size, colour, or neuration; but differs in anal structure, as follows:—

In the ♂ the inner edge of the superior appendages (the part that is thickened and blackish in *Ps. pusilla*) is provided with a series of closely-placed, straight, black teeth, arranged in a comb-like manner, most visible from beneath. The inferior appendages each form two rather long slightly-curved branches, the outermost of which is the shorter, and is broad and irregularly toothed on its lower edge, if viewed laterally.

♀ apparently similar in structure to *Ps. pusilla*.

Portugal (Ponte de Morcellos, Beira Baixa, 12th June, *Eaton*, 3 ♂, 4 ♀).

The character emphasized in the above description leaves no doubt as to the specific distinctness of these individuals; it is perfectly constant, and very visible in the 3 ♂ examined.

PLATE VI.—Fig 1, apex of abdomen of ♂, from side; 2, same, beneath (shewing the comb-like teeth); 3, same of ♀, from side.

Fam. RHYACOPHILIDÆ.

I now indicate the Sections of this Family, as under:—

Section of CHIMARRHA (= Section i, p. 430).

„ „ RHYACOPHILA (= „ ii, p. 432).

„ „ AGAPETUS (= „ iii, p. 467).

Section iv. is transferred to the *Leptoceridæ*, cf. ante, p. 32.

Chimarrha marginata, p. 431.—Portugal (near Caldas de Monchique, Algarve, 18th May; Ponte de Morcellos, Beira Baixa, 12th June; near Villa Real, Traz-os-Montes, 23rd and 24th June; *Eaton*), hence this insect has a wider southern range than I anticipated.

Rhyacophila torrentium, p. 436.—Add: North Italy (the bridge over the Oglio at Ponte di Legno, 4240 ft., 29th July, *Eaton*, common; Macugnaga, Val Anzasca, over 5000 ft., 15th July, *McLachlan*, not rare).

Rhyacophila Albardana, p. 437, and Supplement, p. lxxv.—Add to localities in Switzerland: Thusis, 22nd August, *McLachlan*; also North Italy (Val Furva, about 5000 ft., end of July, *Eaton*).

Rhyacophila dorsalis, p. 439, and Supplement, p. lxxv.—Examples taken by myself on the Rhône at Geneva are certainly *dorsalis*, and some of them have the penis-sheaths turned downward. It thus becomes advisable to transfer the synonym "*Rh. vulgaris*, Pict., *partim*," from *Rh. obtusidens* (p. 440) to *Rh. dorsalis*.

Rhyacophila persimilis, p. 440, and Supplement, p. lxxv.—Two ♂ from the stream between the Statzer See and Lake St. Moritz, Upper Engadine (*McLachlan*), differ slightly in having the dorsal process considerably broader and shorter, but the penis is not notably different from that of *persimilis*, typical examples of which occurred within a short distance. A similar example was captured by me in July on the river San Bernardino at Pallanza, Lago Maggiore. These appear to show an approach toward *Rh. acutidens*.

Rhyacophila relictæ, p. 412.—Add: Portugal, as a locality (River Corgo at Villa Real, 930 ft., 23rd June; near Ruivães, 1453 ft., 29th June; near Salamonde, 403 and 2000 ft., 30th June; *Eaton*, 5 ♂, 1 ♀).

Rhyacophila rectispina (*n. sp.*).

Constitutes a very distinct Group of Division A, which may (provisionally) precede that of *Rh. obliterated*.

Anterior-wings of ♂ rather broad (slightly narrower and more acute in the ♀), much as in *Rh. septentrionis* and allies (radius apparently furcate at its end in the anterior-wings; doubt-

fully so in the posterior): clothed with bright golden-yellow pubescence, in which are pale grey reticulations and two more or less distinct oblique grey fasciæ, one median, the other sub-apical; grey spots round the apical margin; dorsal blotch distinct, somewhat rhomboidal, margined with grey internally. Posterior-wings pale grey, sometimes slightly irrorated with paler dots in the apical portion, and with small paler spots round the apical margin (occasionally the anterior-wings are nearly wholly golden, and in these examples the posterior-wings have golden pubescence on the apical portion).

In the ♂ the dorsal process is pale yellow, slightly upturned (with the appearance as of a false transverse suture at its base), *elongately oblong, the sides parallel, the apical margin deeply excised, leaving the angles prominent*. Lateral lobes very small, scarcely visible. Inferior appendages with a long and broad basal joint: second joint shorter, but still long, *its upper edge oblique (slightly convex) from base to apex, but with a small notch immediately before the obtuse apex*; lower edge straight. Penis-sheaths spiniform, stout, reddish-testaceous, *the basal portion much curved in a nearly semi-circular manner, then suddenly geniculate and produced outwardly, at a right angle, into a straight, very acute, spine*. Penis reddish-testaceous, elongate, *divided at the apex, the upper portion obtuse, with a slight notch above immediately before the apex*; the lower portion *produced suddenly downward, at a right angle, into an acute spine placed between the spine of the penis-sheaths* (this lower portion appears to be continued as a curved carina to the base of the organ). No visible lower penis-cover. Tooth on 7th ventral segment strong; that on the 6th stronger than is usual.

In the ♀ the valves of the 8th segment are long and broad, *the lower edge much longer than the upper*, the apical edge, therefore, very oblique, slightly excised. Tooth on 6th ventral segment very strong.

Length of body, ♂, 7–10 mm., ♀, 10 mm. Expanse, ♂, 23–30 mm., ♀, 25–26 mm.

North Italy (Val Anzasca and its tributary valleys, but rarely extending to the higher parts, July, *McLachlan* and *Eaton*, very common, nearly 50 examples, of which only three are ♀; Val Cannobbio, July, *McLachlan*, not common).

It is difficult to satisfactorily locate the Group of which this forms the type, but at present it may be placed between that of *fasciata* and *obliterata*.

That a visit to a previously unexplored district of North Italy should have resulted in the finding in abundance of such a very distinct species, is a proof, if any were needed, of the apparently inexhaustible nature of this genus.

PLATE VII.—Fig. 1, dorsal process, &c., of ♂, above; 2, apex of abdomen of ♂, from side; 3, penis and penis-sheath, from side (more enlarged); apex of abdomen of ♀, from side.

Rhyacophila aurata, p. 448.—The former indication "Switzerland" was, I think, erroneous, through confusion with *Rh. vulgaris*. The species, however, does really inhabit Switzerland: I have seen a ♂ (and a doubtful ♀) from Lenz, in the Grisons (Zürich Museum): it is darker than the Austrian examples, the anterior-wings less golden, with distinct grey reticulation.

Rhyacophila contracta, p. 449.—From Portugal (near Villa Real, Trazos-Montes, 22nd June, *Eaton*) I have 2 ♂ that should apparently be referred here. Although taken together at the same locality, they do not precisely agree in minute details of anal structure. In one, the dorsal process is nearly that of typical *contracta*; the penis has its lower angles less produced. In the other the dorsal process is slightly longer, hence more as in *proxima*, and the lower

angles of the penis are nearly as obsolete as in *fraudulenta*. Both are smaller (expanse, $24\frac{1}{2}$ mm.) than typical *contracta*, and darker; the anterior-wings with more decided golden pubescence, and more distinct markings. (*Vide* remarks to *Rh. proxima*, *infra*.)

Rhyacophila proxima, Supplement, p. lxxvi.—At torrents near Pontresina in the Upper Engadine, about 6000 ft., in August, a species that I refer here was very abundant, and I took about 50 examples: some of them are very large, the ♀ sometimes expanding to 37 mm. It occurred also on the summit of the Julier Pass, 7503 ft., and again at a much lower elevation near Thusis. Eaton found the same form at torrents in the Val Furva, not far from Bormio, North Italy, about 5000 ft., at the end of July. It also occurred at Macugnaga, Val Anzasca, over 5000 ft., in July, but was not common.

All these examples perfectly agree with the typical *proxima* in general *facies*; but the long series shows evident variation in minute structural details, quite independent of locality. The dorsal process is liable to variation in comparative length and breadth (in one example from Pontresina it is nearly triangular; this I regard as an aberration), and the lower angles of the penis vary from being almost as much produced as in *intermedia* and *contracta*, to being as obsolete as in *fraudulenta*, yet it may be said that there is a *facies* about all these species or forms that is distinct (in *fraudulenta* especially marked). It may be that *intermedia*, *contracta*, *fraudulenta*, and *proxima* are structural varieties rather than distinct species, the last being in an especially plastic condition; but further proof is necessary. One ♂ found by Eaton in the Apennino Pistoiese, Central Italy, has the dorsal lobe rather shorter than usual in *proxima*, and the penis as in *fraudulenta*.

Rhyacophila Pascoei, p. 451, and Supplement, p. lxxvi.—Add as a locality in Switzerland: on the Rhône at Geneva, 5th July (*McLachlan*, 1 ♂).

Rhyacophila vulgaris, p. 452, and Supplement, p. lxxvii.—I mention this species in order to correct an erroneous idea that I adopted the name in direct opposition ("im directen Widerspruch") to my own statement, at p. 453; *cf.* Hagen, Zoologischer Jahresbericht, i, p. 581. I thought it was made sufficiently clear *why* I do not adopt the name *venusta*. Pictet never *published* that name, and the fact that he sent out specimens bearing the name in MS. goes for nothing. My words, "I have not considered it wise to now recognise after-thoughts indicated in MS." (p. 453), sufficiently explained the retention of the term "*vulgaris*" for the present species, and it is very applicable, for it is certainly one of the most common of the Swiss species of the genus, and, moreover, nearly all Pictet's published details for "*vulgaris*" were taken from it, and not from *dorsalis* or its allies.

Rhyacophila meridionalis, p. 454.—I have examined E. Pictet's type, and find it specifically identical with the examples taken by Eaton. It is small, and expands to only 21 mm.

Rhyacophila adjuncta (n. sp.).

Apparently of the Group of *Rh. vulgaris*, and allied to *meridionalis*.

Anterior-wings of the ♂ somewhat cinereous, varied and reticulated with brown; a distinct broad, oblique, cinereous sub-apical fascia, bordered on either side with a brown line; dorsal blotch large and distinct, continued (but narrowed) to the base, cinereous, bordered above with brown or fuscous; radius indistinctly furcate at its end. In the ♀ these wings are longer and narrower, and less distinctly fasciated.

In the ♂ the dorsal process is rather long, narrow, obtuse, *not acuminate, the sides nearly parallel*. Lateral lobes small, not dilated, rather shorter than the process. The second joint is *less deeply excised* than in *vulgaris*, both the branches stout, the upper somewhat acute at the apex, the lower rather longer and obtuse. Sheaths long, *spiniform*, curved either upward or downward in the dry insect. Penis *very short, slender, straight* (seldom visible). Lower penis-cover short. Tooth on the 7th ventral segment very small.

In the ♀ the valves of the 8th segment are broad, the appendage prolonged into an obtuse apex, below which the apical margin is rather suddenly excised.

Length of body, ♂, 7–8 mm. Expanse, ♂, 22–25 mm., ♀, 28 mm.

Portugal (near Villa Real, Traz-os-Montes, 1000–1630 ft., 23rd to 25th June, *Eaton*, 7 ♂, 1 ♀).

In the markings of the anterior-wings this somewhat approaches *Rh. munda*, and some varieties of *septrionis*. It may, I think, be conveniently placed in the Group of *vulgaris*, but it differs from the other species of that Group in the non-acuminate dorsal lobe, and in the short lower penis-cover. In some respects there appears to be affinity with the Group of *Rh. dorsalis*, notwithstanding the form of the second joint of the inferior appendages.

PLATE VII.—Fig. 1, dorsal process, lateral lobes, &c., of ♂, above; 2, apex of abdomen of same, from side; 3, penis and sheaths, from side (more enlarged); 4, apex of abdomen of ♀, from side.

Rhyacophila Rougemonti, Supplement, p. lxxvii.—From Corsica (*Damry*) I have received a ♂ that is extremely close to *Rougemonti*, and in all probability identical therewith; there are very slight structural discrepancies when compared with the single type of *Rougemonti*. The locality leaves some doubt in my mind as to the correctness of that given for the type of *Rougemonti*, although the late Prof. de Rougemont assured me, more than once, that, to the best of his belief, the latter was from the neighbourhood of Neuchâtel.

A ♀ from Corsica, that accompanied the ♂, has the valves of the 8th segment somewhat as in the Group of *intermedia*. I dare not conclude that it is of the same species as the ♂.

Rhyacophila lusitanica (n. sp.)

Constitutes a very distinct Group of Division A, and should follow that of *Rh. munda*, at the end of the Division.

Darker than the other Groups of the Division (excepting that of *torrentium*), the body nearly black above. Antennæ darker, fuscous annulated with yellowish. Palpi fuscous. Legs yellowish; anterior and intermediate tibiæ fuscous externally, with a pale median space; all the tarsi fuscous externally; spurs fuscous. Anterior-wings narrow, fuscous, clothed with golden-brown pubescence, but thickly irrorated or reticulated with cinereous, forming indistinct transverse oblique fasciæ; the inner edge of the dorsal blotch indicated by a blackish-

fuscous mark; pterostigma blackish-fuscous varied with cinereous; a series of blackish-fuscous spots round the apical margin, interrupted with cinereous dots, which invade the fringes; a very distinct whitish spot at the thyridium; neurulation dark fuscous. Posterior-wings fuliginous, iridescent, with dark fuscous pterostigma and neurulation.

In the ♂ the anal parts are mostly fuscous. The dorsal process is in the form of a *long, laterally compressed, acuminate spine, slightly curved and somewhat directed downward*; it is considerably widened at the base, and is continued as a kind of blunt keel along the surface of the last dorsal segment. The lateral lobes are very small, widely separated, and sub-cylindrical, scarcely extending beyond the margin of the segment. Inferior appendages with a long, straight, basal joint; the second joint has its *upper edge very short*, slightly produced into an angle if viewed from above, the lower long, *the apical edge very oblique and straight*, so that the apex of the joint is very obliquely truncate. Much internally there appears to be a very short, notched upper penis cover. Penis doubtful (not visible in dry examples). Lower penis-cover yellowish-testaceous, much produced; *viewed laterally it is somewhat widened at the base, then narrowed, and finally extremely dilated*; viewed above it is *concave, with the edges slightly inturned, but not symmetrically*, the right-hand side of the apex being more dilated than the left. Sheaths in the form of long testaceous piceous spines, *the two differing much in form and direction*.

In the ♀ the valves of the 8th segment are long and broad, the upper edge much produced and subacute at the apex, immediately below which the apical margin is deeply excised.

Length of body, ♂, $6\frac{1}{2}$ — $8\frac{1}{2}$ mm. Expanse, ♂, 20—23 mm., ♀, 24 mm.

Portugal (near São Romão, Beira Baixa, 1792 ft., 9th June; near Villa Real, Traz-os-Montes, 1730 ft., 22nd June; *Eaton*, 4 ♂, 1 ♀).

This curious species is without a parallel or near ally amongst European forms. It certainly belongs to Division A, according to all its characters, much as it differs from other forms in that Division. The dorsal lobe is truly such, and continuous with the segment, notwithstanding its singular form. The second joint of the inferior appendages is somewhat as is seen in the Group of *fasciata*. The lower penis-cover (for I cannot think this represents a true penis) and sheaths are very extraordinary, not only on account of their form, but also for their asymmetric condition, which can be no illusion caused by alteration in drying, because all the four males essentially agree in this respect. *Rh. lusitanica* is altogether a peculiarly interesting species.

PLATE VII.—Fig. 1, dorsal process, &c., of ♂, above; 2, apex of abdomen of same, from side; 3, dorsal process, &c., from side (more enlarged); 4, lower penis-cover and sheath, right-hand side (ditto); 5, the same, left-hand side; 6, apex of abdomen of ♀, from side.

Rhyacophila tristis, p. 456, and Supplement, p. lxxvii.—Portugal (streamlet near Cea, 1792 ft., 4th and 11th June; stream from the Estrella, near São Romão, 2442 ft., and near Sabugueiro, 4092 ft., 5th June; near Villa Real, 1730 ft., 22nd and 24th June; near Salamonde, 403 ft., 30th June; *Eaton*, many examples). Belgium (stream at the Chemin de Penant near Dinant, 14th July, *McLachlan*, common).

Rhyacophila aquitanica, p. 457.—Three ♂ from the Vosges (Remiremont and Gérardmer; July, *McLachlan*) agree with the typical individuals from Auvergne.

Rhyacophila pubescens, p. 458, and Supplement, p. lxxviii.—Add: Belgium (Route de Froidevaux, near Dinant, 13th July, *McLachlan*, not uncommon).

Rhyacophila glareosa, p. 459, and Supplement, p. lxxviii.—Common near Pontresina, Upper Engadine, over 6000 ft., in August, *McLachlan*.

Rhyacophila Meyeri, p. 461.—Several examples from Switzerland (Locarno, Ticino) are in the Zürich Museum. North Italy (Val Anzasca, at dribbling rock-springs in the lower portion, July, *McLachlan* and *Eaton*, not common; Val Cannobbio, Lago Maggiore, July, *McLachlan*, more common).

As *Rh. Meyeri* was originally described from only one ♂ in bad condition, the discovery of additional material enables me to supplement and amend the original description.

The anterior-wings are clothed, but not densely, with very pale yellowish pubescence, in which, occasionally, especially on the transverse nervules, are indications of pale grey markings.

In the ♂ the two dorsal spines are usually more or less divergent, seldom so parallel as is indicated in my former description, and in the figure on Plate xlix.

In the ♀ the 8th segment is furnished ventrally with a long, narrow, sub-obtuse valve.

Expanse, ♂, 15–20 mm., ♀ (I have seen only one) 14 mm.

PLATE VII.—Fig. 1, dorsal spines of last segment of ♂, much enlarged; 2, apex of abdomen of ♀, from side. (The figures on Plate XLIX are correct, but the other extreme is here given with respect to the dorsal spines).

Rhyacophila stigmatica, p. 461.—Add: Switzerland (common near Pontresina, Upper Engadine, over 6000 ft., August, *McLachlan*). North Italy (Val Mazza, 5650 ft., 29th July, *Eaton*, 1 ♂; Val Anzasca, 17th July, *McLachlan*, 2 ♂, 1 ♀).

Rhyacophila philopotamoides, p. 463.—From the Vosges (near Gérardmer, July, *McLachlan*) I have one ♂ excessively close to this species, if it be not absolutely identical therewith.

Glossosoma privatum (*n. sp.*).

The anterior-wings of the ♂ *without a basal callosity*, hence the species is allied to *G. spoliatum*.

In colours it generally resembles the other species of the genus. The pubescence of the anterior-wings is more golden (mixed with blackish) than is usual; the second apical cellule truncate at its base (in the examples before me); in the posterior-wings this cellule is acute or sub-acute. Intermediate tibiæ with a blackish mark at the apex, and another at the median pair of spurs.

In the ♂ the spoon-shaped lamina of the 6th ventral segment, and the tooth of the 7th, as usual, the latter very prominent, triangular and acute. Superior appendages with a broad tooth at the upper angle, succeeded by a more slender, somewhat curved tooth; the lower angle produced into a very long, slender, curved process (the opposing processes somewhat forcipate). Intermediate appendages long, sub-cylindrical, very slightly curved, hairy. Terminal ventral process asymmetric (as usual), broad, flattened, scarcely concave above; its apex somewhat suddenly acuminate, acute, with a slight, short, longitudinal apical carina beneath.

♀ unknown.

Length of body, $5\frac{1}{2}$ –6 mm. Expanse, 14– $15\frac{1}{2}$ mm.

Portugal (near Villa Real, about 1600 ft., Traz-os-Montes, *Eaton*, 3 ♂).

Although agreeing with *G. spoliatum* in the absence of a callosity at the

base of the anterior-wings, it is otherwise very different by the anal parts. The superior appendages of *privatum* most resemble those of *G. Boltoni*, whereas in *spoliatum* they most resemble those of *G. vernale*. The presence or absence of the basal callosity scarcely seems to be of generic importance, the species otherwise agreeing so generally in all points of structure.

PLATE VII.—Fig. 1, neururation of base of inner margin of anterior-wing of ♂ (showing the absence of the callosity)*; 2, apex of abdomen of ♂, from side; 3, superior appendage, above (in outline); 4, terminal ventral process, beneath (ditto).

Glossosoma Nylanderi, p. 474.—In the collection of Max von zur Mühlen of Dorpat is a ♂ of this interesting species from Finland, in good condition; it is smaller (expanse, $12\frac{3}{4}$ mm.) than the original type. There is no basal callosity in the anterior-wings, but the dividing nervule of the post-costal basal cellules is considerably thickened and inflated (see figure). My former figure (pl. 1) of the anal parts is sufficient for identification, but I do not see the tuft of hairs there represented at the tips of the process on either side of the terminal ventral process, and it is possible these may not always be equal in length (thus probably asymmetric). It may now be considered practically certain that the ♀ (from the same Dorpat collection) mentioned at the bottom of p. 474 pertains to the same species.

PLATE VII.—Fig. 1, Post-costal basal cellules of left anterior-wing of ♂ (very much enlarged).

Agapetus incertulus (*n. sp.*).

Closely allied to *A. fuscipes* and *nimbulus*, especially to the latter. In the single type, apical fork No. 4 in the anterior-wings extends further inwardly than No. 3.

In the ♂ the sides of the upper penis-cover are shorter than the inferior appendages, very broad laterally, testaceous and nearly diaphanous. Sheaths not spiniform, in the form of two laterally flattened fuscous plates, the ends of which extend beyond the inferior appendages, and are nearly truncate and somewhat dilated at the lower apical edge. Inferior appendages, laterally, as in *nimbulus*; ventrally there appears to be a slight basal dilatation of the inner edge, forming a tooth or angle, following this is an inner ridge, about the middle of which are two sharp triangular teeth rather closely placed (apical teeth absent or not evident in type). Ventral process shorter and thicker than in *nimbulus*, its apex more dilated, and more flattened ventrally.

Expanse, about $7\frac{1}{2}$ mm.

Portugal (near Agualva on the road to Cintra, near Lisbon, 31st May, Eaton, 1 ♂).

Of the distinctness of this individual from *fuscipes* there can be no doubt. Its relationship with *nimbulus* is closer, but I think the characters pointed out are sufficient to separate it therefrom; but it should be remarked that in *nimbulus* the penis-sheaths are also not spiniform, but apparently broad and flattened laterally, but not exerted as in *incertulus*. The neural character mentioned is important if found to be constant.

PLATE VII.—Fig. 1, apex of abdomen of ♂, from side.

* Upon comparing this figure with that given for *spoliatum* (Pl. I., fig. 1), a slightly different arrangement of the basal cellules is apparent. My ♂ type of *spoliatum* is not now in a condition that will enable me to confirm the accuracy of the figure given for that species.

NOTE.—One ♂ and two ♀ of an *Agapetus* from near Monchique, Algarve, 19th and 21st May, *Eaton*, are near *fuscipes*, but distinct therefrom according to slight structural differences present in the ♂ (which was in alcohol); it is scarcely safe to name and describe it without having examined more materials.

Agapetus laniger, p. 480, and *pactus*, p. 481.—It now appears to me that the course I took with regard to these two insects was, if not “rash,” certainly “ill-advised” (*cf.* p. 481). In the beginning of July, 1882, I took at Geneva 2 ♂ and 1 ♀ of my *pactus*, and am therefore constrained to believe that Pictet’s *laniger* was this insect, and not the Pyrenean form to which I applied the name. The difficulty arose in the main from the absence of the minute fork at the termination of the radius in the posterior-wings in the ♀ types of *laniger*, Pict., examined by me, a character too unstable to warrant serious consideration. The two species should, therefore, stand as follows (my former *laniger* being renamed):—

Agapetus delicatulus.

A. laniger, McLach., Rev. and Synops., 480 (♂ only), pl. 1, figs. 1—3, *nec* Pict.

A much smaller and more delicate insect as a rule than the true *laniger*. The radius in the posterior-wings is sometimes furcate at the end. The anal parts of the ♀ do not show sufficient characters in dry specimens to merit special mention.

At present known only from the Pyrenees.

Agapetus laniger.

Rhyacophila lanigera, Pict., Recherch., 195, pl. xvi, fig. 19 (1834). *A. laniger*, Hag., Stett. Zeit., 1859, 162; McLach., Rev. and Synops., 480 (♀ only), pl. 1, fig. 4. *A. pactus*, *id.*, *op. cit.*, 481, pl. 1, figs. 1—3 (1879).

The condition of the branches of the upper penis-cover is subject to much and deceptive variation in dry individuals. In two ♂ taken together at Geneva the branches are much longer than the inferior appendages, and much exserted (as in my figs. 1 & 2 for “*A. pactus*”) in one, much shorter than those appendages, and not exserted, in the other.

In two ♂ from Portugal (near Ponte de Morcellos, Beira Baixa, 12th and 14th June, *Eaton*), the branches are shorter than the appendages in both, and apparently somewhat thicker than in other examples.

I have also taken this species on the Rhine, near Basle, in August. The radius is very rarely not furcate at the end in the posterior-wings.

Pseudagapetus diversus (*n. sp.*).

Closely allied to *Ps. insons*; differs as follows:—Pubescence of head and thorax golden or golden-brown. Pubescence of anterior-wings golden or golden-brown, denser, the membrane less iridescent (as it is also in the posterior). Legs paler: the intermediate tibiæ and tarsi distinctly (though only slightly) dilated in the ♀.

In the ♂ the superior appendages narrower, longer, and less triangular. The apex of the inferior appendages apparently more obtuse. The process on the 6th ventral segment broader, its apex nearly semi-circular if viewed ventrally: tuft of hairs on the 7th ventral segment less indicated.

Size about as in *Ps. insons*, or slightly less.

Portugal (near Cea, 1792 ft., Beira Baixa, 4th June, 1 ♂; near Villa Real, Traz-os-Montes, 22nd June, 1 ♂, 2 ♀; *Eaton*).

There can be no doubt that these individuals are specifically distinct from *Ps. insons*, although quite of the same general structure.

PLATE VII.—Fig. 1, apex of abdomen of ♂, from side.

N.B.—It should be noted that my words “slender in the ♂” relating to the intermediate tibiæ and tarsi of the ♀ (of *Ps. insons*), in the generic description at p. 485, are hardly strictly correct. There is just the slightest approach to dilatation: this is much more marked in *Ps. diversus*, though the dilatation is still much less than in *Agapetus* and *Synagapetus*.

CATAGAPETUS (*n. g.*).

Allied to *Synagapetus* and *Pseudagapetus*. Anterior-wings of the ♂ clothed with thickened erect hairs, excepting the apical portion; those of the ♀ with ordinary adpressed pubescence. Neuration of anterior-wings nearly as is usual in *Agapetus* and allies: in the posterior-wings the sub-costa becomes confluent with the radius,* there is a small closed discoidal cell, and apical fork No. 2 extends to the anastomosis. Intermediate tibiæ and tarsi dilated in the ♀. Anal parts somewhat as in *Pseudagapetus*, but the process or lobe on the 6th ventral segment in the ♂ is short and very broad, not extending beyond the margin of the segment.

A very distinct genus, allied to *Agapetus*, &c., but differing especially in the closed discoidal cell of the posterior-wings, and the confluent sub-costa and radius in these wings. The clothing of thickened erect hairs on the anterior-wings of the ♂ is analogous to that seen in (both sexes of) *Ptilocolepus*, but is less extended and finer, and the neuration, &c., differ considerably.

Catagapetus nigrans (*n. sp.*).

Black; head and pronotum clothed with black (somewhat brownish on the warts) pubescence. Head (denuded) with five yellowish warts, viz.: one, small and rounded, between the antennæ; two, small and transverse, pointed at either end, near the middle of the disc; and two larger, long-oval, and transverse, posteriorly. Pronotum with two distant, short-oval, yellowish warts. Humeral callosities yellowish and conspicuous. Antennæ strong, blackish. Palpi blackish. Legs fuscous, somewhat testaceous at the articulations (the anterior pair nearly wholly with a testaceous tinge); posterior tibiæ with long greyish hairs, which are longer in the ♂ than in the ♀. Abdomen (dry) with reddish lateral lines; clothed with sparse silvery hairs, especially beneath. Anterior-wings (when in good condition) clothed with intensely

* It should be remarked that there is here an anomaly in what are apparently the sub-costa and radius. Ordinarily the radius is thickened and the sub-costa slender, but here the nervure that from its position should represent the sub-costa is thickened up to its confluence with what appears to be the radius, which latter remains slender for all its length.

black pubescence (differing in its nature in the sexes as noticed in the generic description) ; membrane (denuded) dark smoky-grey, densely and finely punctate: neuration strong, black; in the anterior-pair apical fork No. 1 is acute at its base; No. 3, long: fringes long, black. Posterior-wings scarcely paler than the anterior, with very long fringes.

In the ♂ the anal parts are not easy to discriminate in the dry insect. The superior appendages appear to be represented by minute lateral setiferous tubercles. Last ventral segment continuous, dilated laterally, dark, and shining. From within this segment proceed what I consider to be the inferior appendages in the form of somewhat oblong flattened dusky plates, the apex of which is obliquely truncate. More ventrally are two other plates, rounded on the margin, from which proceeds the penis-cover (penis?), which is somewhat long, pale yellow, and directed upward. Lobe of 6th ventral segment very short and broad, not projecting beyond the margin, its rounded edge scarcely free. On the 7th ventral segment is a tuft of straight yellow bristles.

In the ♀ the supplementary suture on the 6th and 7th ventral segments is continuous, but its ventral edge is scarcely free, though somewhat thickened. A tuft of stiff, straight, yellow bristles on the 8th ventral segment. Ninth segment somewhat divided into a small and narrow dorsal, and a large sub-quadrate ventral, portion. Ovipositor stout, yellow, with very long and slender straight cylindrical appendages.

Expanse, $8\frac{1}{2}$ —11 mm.

Apennino Pistoiese, Central Italy (between Villa Margherita and San Marcello, 2160 ft., 27th July; Font Vacaja Lima, 4410 ft., 2nd August; near Ponte del Lima, 4130 ft., 5th August; *Eaton*, 7 ♂, 16 ♀).

PLATE VII.—Fig. 1, neuration of wings; 2, apex of abdomen of ♂, from side; 3, same of ♀.

N.B.—From Portugal (slopes of Foia, near Monchique, Algarve, 1650 ft., 21st May, *Eaton*) I have 1 ♀ that certainly pertains to this genus, but probably represents a distinct species. It is larger than *C. nigrans* (expanse about 14 mm.), the warts of head and thorax clothed with golden (or golden-brown) pubescence, the pubescence of the anterior-wings golden-grey; and I think there are structural differences, but it is not prudent to describe it in the absence of the ♂.

PTILOCOLEPUS, p. 488

Further materials, and more minute examination, have convinced me that my former description of the anal parts of the ♂ was not quite correct, and further that there are at least two species of the genus.

The elongate hairy process which I termed “inferior appendages” may be truly such, but I am not sure that it is separated into two parts, and if not it might be regarded as a *lower penis-cover* rather than as appendages. Inside this (and with difficulty separable from it) is a pair of much larger testaceous blades (“the yellow furcate process” of my former description), which I think certainly represent penis-sheaths: but it is only occasionally that these are sufficiently exerted for perfect discrimination. Very frequently nothing is visible but the tips of these blades.

Ptilocolepus granulatus, p. 490, and Supplement, p. lxxix.—Add to localities: Belgium (near Bouillon, 10th July, *McLachlan*); North Italy (Val Anzasca, &c., common, *McLachlan* and *Eaton*); Central Italy (Apennino Pistoiese, *Eaton*).

The anal parts of the ♂ seldom much exerted. The inferior appendages (?) gradually becoming rather broad. Penis-sheaths furcate laterally, the upper branch long, and more or less slender, curved downward; the lower branch short.

PLATE VII.—Fig. 1, lateral view of anal parts of ♂ in an example in alcohol from the Pyrenees, flattened out between glass; 2, the same as seen in a dry example from Belgium, in which the parts are more than usually exerted.

N.B.—In a ♂ example from Saxony the sheaths are furcate, but the upper branch seems to be more obtuse. If this should prove constant, it may be that *turbidus*, Kol., is distinct from *granulatus*, Pict.

Ptilocolepus extensus (*n. sp.*).

Of the same size and general appearance as in *granulatus*. The whitish-hyaline spots at the thyridium and arculus (especially the former) appear to be large and more distinct than is usual for that species.

In the dry ♂ the anal parts are greatly exerted in all the individuals examined. The inferior appendages (?) much narrower. Penis-sheaths very long, narrow, but gradually dilated on the lower edge, *not furcate* if viewed laterally.

♀ apparently as in *granulatus*.

Portugal (between São Antonio and Coimbra, Beira Baixa, 3rd June, 1 ♂; near Cea, about 1800 ft., Beira Baixa, 11th June, 2 ♂, 1 ♀; a ♀ from near Monchique, about 2800 ft., Algarve, 21st May, probably belongs here; *Eaton*).

These appear to be quite distinct from *granulatus*, according to the anal characters.

PLATE VII.—Fig. 1, lateral view of anal parts of ♂, as seen in dry examples.

Fam. HYDROPTILIDÆ.

Agraylea pallidula, p. 507.—A ♂ from South Tyrol (Riva, on Lago di Garda, 1st August, *Eaton*) agrees structurally with the type-form, but the ground-colour of the anterior-wings is very pale grey, in which are numerous, more or less confluent, paler spots. It seems natural that an *Agraylea* should be spotted, and this condition may probably prove to be more general in *A. pallidula* than the small material as yet to hand seems to suggest. Moreover, *A. multipunctata* has an unicolorous pale form, and an unicolorous black form. *A. pallidula* has, at present, mostly been found only singly and in very widely-separated localities.

Allotrichia pallicornis, p. 509.—Add: Portugal (Cintra, Estremadura, 1st June, 1 ♂, 3 ♀; Villa Real, Traz-os-Montes, 24th June, 1 ♀; *Eaton*); Apennino Pistoiese, Central Italy (*Eaton*, 3 ♂, 2 ♀).

The ovipositor of the ♀ may be retracted altogether, or may be much more extended than is indicated in my figure.

Hydroptila sparsa, p. 511.—I refer here, with slight doubt, examples from Portugal (Cintra, 26th and 27th April, *Eaton*).

Hydroptila longispina (n. sp.).

Antennæ about 30-jointed in the ♂, and about 25 in the ♀, fuscous throughout (in the examples before me). Head, &c., clothed with cinereous pubescence, becoming blackish on the face. Legs dingy-testaceous, the femora fuscous or fuscous; fringes silky-whitish. Anterior-wings blackish, the raised hairs mostly deep black; the markings whitish, consisting of a vague basal streak on the inner margin; a maculose ante-median fascia, more marked as spots extending into the fringes on the costal and inner margins, two opposite post-median spots, one on the costal, the other on the inner, margin, and the apex also has whitish hairs extending into the fringes. Posterior-wings grey, with concolorous fringes.

In the ♂ there is a somewhat boat-shaped dorsal process or plate, concave beneath, acute, if viewed laterally. From beneath this proceed two extraordinarily long slender processes, which appear to be united at the base; one of these is only slightly curved, flattened and dilated before the fine apical portion; the other is much more slender, not dilated, much curved, and often spirally twisted round the stouter process (but the position is varied in dry examples). Beneath the thickened common base of these processes there appears to be a small hook, directed downward if viewed laterally. Lobe of ante-penultimate ventral segment very long, very slightly curved, and somewhat dilated at the apex.

The ♀ presents no special anal characters.

Expanse, about $5\frac{1}{2}$ —6 mm.

England (Ambleside, common, *J. J. King*).

It appears to me, from several points of view, that the nearest ally of this insect is *H. femoralis*, but specific identity therewith is very improbable. The anal structure is somewhat similar, so far as regards the dorsal process, but in no specimen of *femoralis* have I seen any approach to the presence of the two extraordinary spine-like processes that are so conspicuous in *longispina*, and which were present in all the examples examined, but varying slightly in amount of exertion, and considerably in relative position (owing to desiccation). I cannot consider either of these spines as representing the penis, and regard them rather as "sheaths" unequal in development (if either of them is really the penis, it must be the stouter and less curved one).

PLATE VII.—Fig. 1, neuration of anterior-wing; 2, apex of abdomen of ♂, from side; 3, same, beneath.

Orthotrichia atra, p. 520.—This is a true *Stactobia*, and thus becomes:—

Stactobia atra.

Add to previously-given bibliography:—*S. atra*, McLach., Journ. Linn. Soc., Zoology, xvi, 161.

Eaton found it commonly in Madeira in November, between Cama dos Lobos and Cabo Girão, and below Sant' Anna; also one example in Grand Canary, near Teror, 1600 ft., 9th December.

The following is an amended description:—

Black; clothing of head and thorax deep brownish-black. Antennæ blackish-brown, 18- or 19-jointed. Head (denuded) transverse; the disc elevated in the fresh insect, finely punctate; posteriorly are two very large, pyriform, punctate warts; (in the dry insect, along the middle, longitudinally, is a raised keel, dilated anteriorly and posteriorly; on each side of this is a deep cavity, caused by the collapsing of the sides of the disc, in which, close to the eyes, the minute lateral ocelli are seated). Legs blackish-brown, with a slight silky testaceous tinge, hinder pair

with very long concolorous fringes. Abdomen blackish, clothing greyish-brown. Anterior-wings densely clothed with black pubescence (becoming brownish by age); along the radius are a few, distant, erect (or out-turned) yellow hairs, and there are similar distant down-turned yellow hairs along the inner margin (these hairs are only visible in specimens in good condition); the very long fringes concolorous with the pubescence. Posterior-wings grey, iridescent, with dark grey fringes.

In the ♂ the only distinctly visible anal part is a testaceous, semi-transparent, laterally flattened, obtuse process (which can be more or less exerted), and on either side of it there appears to be a closely-applied piece produced into a spine at its apex (a down-turned lobe on either side at the base of this process, is a little uncertain). Inferior appendages almost spiniform, with incurved tips. Lobe of ante-penultimate ventral segment very long, less clavate at its apex than is the case in the other described species of the genus.

In the ♀ the apex of the abdomen ends in a testaceous ovipositor, with two slender apical processes (this ovipositor can be nearly wholly retracted and also greatly extended).

Expanse, $5\frac{1}{2}$ —7 mm.

This being so much larger than the other described species of the genus, I was enabled to secure a better figure of the neurulation, which proves that in *Stactobia* there are at least two transverse nervules in a line above the arculus in the anterior-wings (possibly there is also a third, closing the cellula thyridii, but I could not detect it). The few yellow erect hairs on the anterior-wings are analogues of those that produce the spots in the other species.

Stactobia fuscicornis, p. 517.—Add: Portugal (between Cea and Sabugueiro, Beira Baixa, 3490 ft., 7th June; between Oporto and Santa Anna, 50—200 ft., 18th June; near Villa Real, Traz-os-Montes, 1630 ft., 24th June; *Eaton*); North Italy (Val Anzasca, abundant at dribbling rock-springs in the warmer parts, in July, *McLachlan* and *Eaton*; Val Cannobbio, *McLachlan*); Central Italy (between Villa Margherita and San Marcello, Apennino Pistoiese, 2510 ft., 27th July, *Eaton*).

I am of opinion that it was this species I saw at sunny rock-springs in the Val Levantina, Ticino, Switzerland, but failed to preserve examples.

Orthotrichia angustella, p. 519.—Add: Portugal (near Cintra, Estremadura, 31st May and 1st June; Ponte de Morcellos, Beira Baixa, 12th June, *Eaton*).

***Oxyethira spinosella* (*n. sp.*).**

O. — *n. sp.*, *McLach.*, Journ. Linn. Soc., Zoology, xvi, p. 162 (noticed).

Apparently scarcely to be distinguished from *O. costalis* in general appearance, slightly smaller; perhaps the fringes of the legs are darker, and the anterior-wings have more decided blackish longitudinal streaks in the basal half, and the costal fringes more mixed with blackish, so that the wings are generally darker, the pale (whitish) markings as usual.

In the ♂ the penis is whitish and semi-transparent, *its apical portion dilated (asymmetrically) on one side only (perhaps accompanied by a single sheath)*. Inferior appendages with three sharp blackish apical spines, whereof the median is the longest, the inner finer and placed somewhat distant from the two others.

Madeira (Ribiera Fria near Faial, 25th November; “levada” on cliff below Sant’ Anna, 26th November; *Eaton*, 3 ♂, 1 ♀).

Certainly distinct, in consequence of the spines at the apex of the inferior appendages; the asymmetric dilatation of the apical portion of the penis appears to be constant. More materials, and fresh, or in alcohol, are necessary for more exact details of the anal parts.

***Oxyethira unidentata* (n. sp.).**

Similar to *O. costalis* in general appearance.

In the ♂ the anal parts are arranged after the same plan. The penis long, rather slender, with a sharp tooth on the left-hand side (viewed from beneath) just below the apex: there appears to be a single longer sheath placed on the right-hand side (from beneath). Inferior appendages (of which only the tips are visible in dry examples) apparently stouter than in *costalis*, the tips sub-obtuse and turned outward.

Portugal (streamlet west of Silves, Algarve, 17th May, *Eaton*, 7 ♂).

This must be distinct from *costalis* (according to the anal parts of the ♂). It is difficult to make a satisfactory figure from dry examples only, in consequence of the hairs; never more than the tips of the inferior appendages are visible, and the form of the penis and its sheath differs (through desiccation) somewhat in each individual, but the unilateral tooth is always present.

N.B.—It was not found possible to reproduce the figures I had made for *Stactobia atra* and *Oxyethira spinosella* and *unidentata*, which must be reserved for another occasion.

Also it was not found possible to notice at least three undescribed species of *Hydroptilidæ* in my collection without the chance of delaying the publication of this "First Additional Supplement." These are likewise reserved for another occasion.

ERRATA.

Page 24, line 7 from top, for "inferior," read "superior."

„ 53, „ 32 „ for "PLATE V," read "PLATE VI."

„ 60, „ 8 from bottom, for "412," read "442."

EXPLANATION OF PLATES.

N.B.—Full explanation of the various figures will be found upon referring to the page indicated for each species.

PLATE I.

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PLATE II.

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